



**NSRIT**

**AUTONOMOUS**

**SEMESTER END  
EXAMINATION MODEL  
QUESTION PAPERS**

**Semester V  
B. Tech.**

**ACADEMIC  
REGULATION  
2020**

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## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Common to All			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20SHO01	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Women and Society (Open Elective)</b>						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What did the first wave of feminism focus on?	20SHO01.2	L1
2	What is gender equality?	20SHO01.1	L1
3	Recall Marxist and Socialist Feminism	20SHO01.2	L1
4	What is the main role of gender in our society?	20SHO01.4	L1
5	What did you understand the difference between sex and gender?	20SHO01.1	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What are the theories of social construction of gender?	6M	20SHO01.1	L2
6 (b)	Explain about any types of Feminism	6M	20SHO01.2	L2
<b>OR</b>				
7 (a)	Status of Women – From Ancient India to Present Time Period	8M	20SHO01.3	L2
7 (b)	What are patriarchal practices?	4M	20SHO01.1	L1
8 (a)	Discuss the positive and negative portrayal of women in media	8M	20SHO01.5	L2
8 (b)	“Empowering women is the key to control population growth”. Discuss	4M	20SHO01.3	L2
<b>OR</b>				
9 (a)	Define Feminism. Explain any two important perspectives of feminism	6M	20SHO01.2	L2
9 (b)	Discuss the role of women’s movement in post independence India	6M	20SHO01.3	L2
10 (a)	Critically evaluate the representation of women in the media	8M	20SHO01.5	L2
10 (b)	Does traditional knowledge of women integrate with science? Discuss	4M	20SHO01.3	L2
<b>OR</b>				
11 (a)	Describe the changing status of women in India from colonial to the post-independent period	8M	20SHO01.2	L2
11 (b)	How are women portrayed in media? Analyze critically	4M	20SHO01.5	L2
12 (a)	How does gender construction take place in society?	6M	20SHO01.1	L1
12 (b)	What are the five 5 factors affecting gender roles?	6M	20SHO01.5	L1
<b>OR</b>				
13 (a)	Discuss the measures for prevention of crimes against women in India	8M	20SHO01.4	L2
13 (b)	Is there a link between gender inequality and poverty? Discuss with examples	4M	20SHO01.1	L2
14 (a)	Explain different theories of how gender roles are formed	6M	20SHO01.4	L2
14 (b)	Discuss the nature and scope of women’s political participation in India	6M	20SHO01.3	L2
15 (a)	Explain the role of media in women’s empowerment in Indian society	6M	20SHO01.5	L2
15 (b)	What is the difference between gender stereotypes and gender roles?	6M	20SHO01.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Mechanical Engineering			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20ME002	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Unconventional Machining Process</b>						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	List any two process variables which affect the MRR in Abrasive Jet Machining (AJM)		20ME002.1	L1
2	What do you mean by recast layer with reference to the EDM?		20ME002.1	L1
3	Recall the metal removal mechanism in Plasma Arc Machining		20ME002.2	L1
4	List any four devices which produce electron beam		20ME002.2	L1
5	What is the difference between ECG and conventional grinding?		20ME002.3	L2
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Give a detail classification of the unconventional machining processes	6M	20ME002.1	L1
6 (b)	What are the types of transducers used in Ultrasonic machining? Explain their working principles. What is the function of horn in USM?	6M	20ME002.1	L2
<b>OR</b>				
7	Discuss the effects of the amplitude and frequency of vibrations, abrasive grain size and mass flow rate on the rate of material removal and surface finish obtainable in ultrasonic machining	12M	20ME002.1	L2
8	What is the abrasive water jet machining? Explain its principle of operation	12M	20ME002.2	L2
<b>OR</b>				
9 (a)	Mention the advantages, limitations and applications of AJM process	6M	20ME002.2	L1
9 (b)	Explain the process parameters in WJM process	6M	20ME002.2	L2
10 (a)	Briefly discuss electrochemical deburring process	6M	20ME002.3	L2
10 (b)	Explain the principle of electrochemical grinding (ECG) with a neat sketch	6M	20ME002.3	L2
<b>OR</b>				
11	Describe the chemistry involved in ECM process	12M	20ME002.3	L2
12 (a)	What are the basic requirements of tool materials in EDM process? Name any four tool materials with their specific applications	6M	20ME002.4	L1
12 (b)	With a neat sketch, describe the mechanism of material removal in EDM	6M	20ME002.4	L2
<b>OR</b>				
13 (a)	Explain about R-C circuit used for pulse generation in EDM process	6M	20ME002.4	L2
13 (b)	Explain the functions and characteristics of dielectric fluid used in EDM process	6M	20ME002.4	L2
14 (a)	Explain the production of laser beam and working principle of LBM Process	6M	20ME002.5	L2
14 (b)	Explain about the process parameters influencing the electron beam	6M	20ME002.5	L2

	machining process			
<b>OR</b>				
15 (a)	Explain in detail various industrial applications of plasma machining	6M	20ME002.5	L2
15 (b)	Discuss the process parameters of EBM and their influence on machining quality	6M	20ME002.5	L2

MODEL QP

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Mechanical Engineering			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20ME503	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Metal Cutting and Machine Tools</b>						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	Name various single point cutting tools materials available		20ME503.1	L1
2	List any four commonly used attachments on lathe		20ME503.2	L1
3	State the functions of clapper box in shaper		20ME503.3	L1
4	Write any two differences between up milling and down milling		20ME503.4	L1
5	Write any two advantages and limitations of broaching		20ME503.5	L1
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Draw a Merchants circle diagram and derive expressions to show relationships among the different forces acting on the cutting tool and different parameters involved in metal cutting	8M	20ME503.1	L3
6 (b)	How does a lubricant and cutting fluid differ from each other?	4M	20ME503.1	L2
<b>OR</b>				
7 (a)	Describe the tool represented by 10, 10, 6, 6,8,8,1 mm in ASA system	4M	20ME503.1	L2
7 (b)	Draw a neat sketch of a single point cutting tool indicating its complete geometry on it	8M	20ME503.1	L1
8(a)	Distinguish between the turret lathe and capstan lathe with the help of suitable sketches	8M	20ME503.2	L2
8 (b)	Briefly describe the steps in cutting a V thread on an engine lathe	4M	20ME503.2	L2
<b>OR</b>				
9 (a)	Discuss about the classification of lathes	6M	20ME503.2	L2
9 (b)	What is the importance of tool layouts in automats? Explain with an example for any one type with component sketch	6M	20ME503.2	L2
10 (a)	Differentiate between shaping and planing machines	6M	20ME503.3	L2
10 (b)	Draw a neat sketch of slotter and name its main parts	6M	20ME503.3	L1
<b>OR</b>				
11 (a)	Explain with the help of neat sketch open belt and cross belt drive mechanism used in planer machine.	6M	20ME503.3	L2
11 (b)	Explain with neat sketch the construction and working principle of radial drilling machine	6M	20ME503.3	L2
12 (a)	Classify milling machines used in industry giving a brief note on applications	6M	20ME503.4	L2
12 (b)	What are the advantages and disadvantages of CNC machines?	6M	20ME503.4	L1
<b>OR</b>				
13 (a)	Explain the method of carrying out the following milling operations: (a) Milling flat surface (b) Squaring stock by milling (c) Gang milling (d) Profile milling	6M	20ME503.4	L2
13 (b)	Classify NC machine tools	6M	20ME503.4	L1

14 (a)	What is the difference between lapping and honing?	6M	20ME503.5	L1
14 (b)	Describe the centre less grinding process. What are the various feeding methods used in centre less grinding	6M	20ME503.5	L2
<b>OR</b>				
15 (a)	How is center less grinding different from cylindrical grinding?	6M	20ME503.5	L1
15 (b)	Describe the process of hand lapping	6M	20ME503.5	L2

MODEL QP

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Mechanical Engineering			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20MEO01	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	Nano Technology						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	What is Nanoscience and Nanotechnology?		20MEO01.1	L1
2	Define Top-down and bottom-up approach		20MEO01.2	L1
3	What are nanoforms of carbon?		20MEO01.3	L1
4	Recall surface analysis technique		20MEO01.4	L1
5	Define nanobiotechnology		20MEO01.5	L1
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What is Nanometer scale? Explain it in brief.	6M	20MEO01.1	L2
6 (b)	Explain the classification of Nanoscale particles	6M	20MEO01.1	L2
<b>OR</b>				
7 (a)	What are the implications of Nanoscience for physics and chemistry	6M	20MEO01.1	L2
7 (b)	What are the affects of nano materials on magnetic and mechanical properties	6M	20MEO01.1	L1
8	Explain Ball milling method under Top-down approach with the help of neat sketch	12M	20MEO01.2	L2
<b>OR</b>				
9 (a)	Define Lithography.	2M	20MEO01.2	L1
9 (b)	With the help of neat sketch, explain the Pulsed Vapour Deposition (PVD) method.	10M	20MEO01.2	L2
10 (a)	Explain the following (i) Single wall Carbon Nanotubes (ii) Double wall Carbon nanotubes	8M	20MEO01.3	L2
10 (b)	Give a brief on Quantum wires	4M	20MEO01.3	L2
<b>OR</b>				
11	Describe the Buckminster fullerence with the help of neat sketch.	12M	20MEO01.3	L2
12 (a)	Explain X-ray diffraction technique.	6M	20MEO01.4	L2
12 (b)	With the help of neat sketch, explain Scanning Electron Microscopy.	6M	20MEO01.4	L2
<b>OR</b>				
13	Explain the following in brief (i) Atomic force microscopy (ii) Scanning tunneling microscope	12M	20MEO01.4	L2
14	Write a short note on (i) Nano computer (ii) Super chip (iii) Nano crystal	12M	20MEO01.5	L2
<b>OR</b>				
15 (a)	Explain the applications of nanotechnology in medicine	6M	20MEO01.5	L2
15 (b)	Describe about Micro Electro Mechanical Systems(MEMS)	6M	20MEO01.5	L2

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<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Mechanical Engineering			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20ME501	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Dynamics of Machinery</b>						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	Recall gyroscopic couple		20ME501.1	L1
2	Sketch and mention the terms of a Naval ship		20ME501.2	L1
3	What is the function of clutch?		20ME501.3	L1
4	What is balancing of reciprocating engines?		20ME501.4	L1
5	What is meant by forced vibrations?		20ME501.5	L1
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	The turbine rotor of a ship has a mass of 3500 kg. It has a radius of gyration of 0.45 m and a speed of 3000 r.p.m. clockwise when looking from stern. Determine the gyroscopic couple and its effect upon the ship: 1. when the ship is steering to the left on a curve of 100 m radius at a speed of 36 km/h. 2. When the ship is pitching in a simple harmonic motion, the bow falling with its maximum velocity. The period of pitching is 40 seconds and the total angular displacement between the two extreme positions of pitching is 12 degrees.	12M	20ME501.1	L2
<b>OR</b>				
7	A four-wheeled trolley car of mass 2500 kg runs on rails, which are 1.5 m apart and travels around a curve of 30 m radius at 24 km / hr. The rails are at the same level. Each wheel of the trolley is 0.75 m in diameter and each of the two axles is driven by a motor running in a direction opposite to that of the wheels at a speed of five times the speed of rotation of the wheels. The moment of inertia of each axle with gear and wheels is 18 kg-m <sup>2</sup> . Each motor with shaft and gear pinion has a moment of inertia of 12 kg-m <sup>2</sup> . The centre of gravity of the car is 0.9 m above the rail level. Determine the vertical force exerted by each wheel on the rails taking into consideration the centrifugal and gyroscopic effects. State the centrifugal and gyroscopic effects on the trolley.	12M	20ME501.1	L2
8	A band and block brake, having 14 blocks each of which subtends an angle of 15° at the centre, is applied to a drum of 1 m effective diameter. The drum and flywheel mounted on the same shaft has a mass of 2000 kg and a combined radius of gyration of 500 mm. The two ends of the band are attached to pins on opposite sides of the brake lever at distances of 30 mm and 120 mm from the fulcrum. If a force of 200 N is applied at a distance of 750 mm from the fulcrum, find: 1. maximum braking torque, 2. angular retardation of the drum, and 3. time taken by the system to come to rest from the rated speed of 360 r.p.m. The coefficient of friction between blocks and drum may be taken as 0.25.	12M	20ME501.1	L2
<b>OR</b>				
9	Classify Dynamometers and explain the prony and rope brake dynamometers with neat sketches	12M	20ME501.2	L2

10	A shaft fitted with a flywheel rotates at 250 r.p.m. and drives a machine. The torque of machine varies in a cyclic manner over a period of 3 revolutions. The torque rises from 750 N-m to 3000 N-m uniformly during 1/2 revolution and remains constant for the following revolution. It then falls uniformly to 750 N-m during the next 1/2 revolution and remains constant for one revolution, the cycle being repeated thereafter. Determine the power required to drive the machine and percentage fluctuation in speed, if the driving torque applied to the shaft is constant and the mass of the flywheel is 500 kg with radius of gyration of 600 mm.	12M	20ME501.3	L2
<b>OR</b>				
11	The mass of flywheel of an engine is 6.5 tonnes and the radius of gyration is 1.8 metres. It is found from the turning moment diagram that the fluctuation of energy is 56 kN-m. If the mean speed of the engine is 120 r.p.m., find the maximum and minimum speeds.	12M	20ME501.3	L2
<b>OR</b>				
12	A single cylinder reciprocating engine has speed 240 r.p.m., stroke 300 mm, mass of reciprocating parts 50 kg, mass of revolving parts at 150 mm radius 37 kg. If twothird of the reciprocating parts and all the revolving parts are to be balanced, find : 1. The balance mass required at a radius of 400 mm, and 2. The residual unbalanced force when the crank has rotated 60° from top dead centre.	12M	20ME501.4	L3
<b>OR</b>				
13	A vee-twin engine has the cylinder axes at right angles and the connecting rods operate a common crank. The reciprocating mass per cylinder is 11.5 kg and the crank radius is 75 mm. The length of the connecting rod is 0.3 m. Show that the engine may be balanced for primary forces by means of a revolving balance mass. If the engine speed is 500 r.p.m. What is the value of maximum resultant secondary force?	12M	20ME501.4	L3
14 (a)	Explain critical or whirling speed of a shaft.	6M	20ME501.5	L2
14 (b)	Calculate the whirling speed of a shaft 20 mm diameter and 0.6 m long carrying a mass of 1 kg at its mid-point. The density of the shaft material is 40 Mg/m <sup>3</sup> , and Young's modulus is 200 GN/m <sup>2</sup> . Assume the shaft to be freely supported.	6M	20ME501.5	L2
<b>OR</b>				
15 (a)	A shaft of 100 mm diameter and 1 metre long has one of its end fixed and the other end carries a disc of mass 500 kg at a radius of gyration of 450 mm. The modulus of rigidity for the shaft material is 80 GN/m <sup>2</sup> . Determine the frequency of torsional vibrations.	6M	20ME501.5	L2
15 (b)	Derive an expression for torsionally equivalent shaft.	6M	20ME501.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Mechanical Engineering			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20ME502	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Design Of Machine Members-I</b>						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	List the various phases of design.		20ME502.1	L1
2	What are the causes of stress concentration?		20ME502.2	L1
3	Define modified Goodman's line.		20ME502.3	L1
4	Draw a sketch of triple riveted double cover butt joint with zig-zag type of riveting.		20ME502.4	L1
5	Recall the stresses in Helical Springs of circular wire.		20ME502.5	L2
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Describe various theories of failure.	4M	20ME502.1	L2
6 (b)	A steel saw blade 1 mm thick is bent into an arc of a circle of 50 cm radius. Determine the flexural stresses induced and the bending moment required to bend the blade which is 15 mm wide. Take $E = 2.1 \times 10^5 \text{ N/mm}^2$	8M	20ME502.1	L2
<b>OR</b>				
7 (a)	Explain about manufacturing considerations in design.	4M	20ME502.1	L2
7 (b)	The load on a bolt consists of an axial pull of 10kN together with a transverse shear force of 5kN. Find the diameter of bolt required according to i). Maximum principal stress theory; ii). Maximum shear stress theory; iii). Maximum principal strain theory; iv). Maximum strain energy theory; and v). Maximum distortion energy theory. Take permissible tensile stress at elastic limit = 100MPa and Poisson's ratio = 0.3.	8M	20ME502.1	L2
8 (a)	Explain the Soderberg method for combination of stresses.	4M	20ME502.1	L2
8 (b)	A 50 mm diameter shaft is made from carbon steel having ultimate tensile strength of 630MPa. It is subjected to a torque which fluctuates between 2000N-m to -800N-m. Using Soderberg method, calculate the factor of safety. Assume suitable values for any other data needed.	8M	20ME502.1	L2
<b>OR</b>				
9 (a)	Explain Goodman's method to calculate the safe values of fluctuating stress. For what materials it is applicable?	8M	20ME502.2	L2
9 (b)	A simply supported beam has a concentrated load at the center, which fluctuates from a value of P to 4 P. The span of the beam is 0.5 m and its cross-section is circular with a diameter of 0.06 m. Taking for the beam material an ultimate stress of 700 MPa, a yield stress of 500 MPa, endurance limit of 330 MPa for reversed bending, and a factor of safety of 1.3, calculate the maximum value of P. Take a size factor of 0.85 and a surface finish factor of 0.9.	4M	20ME502.2	L2
10 (a)	Discuss on bolts of uniform strength giving examples of practical applications of such bolts.	6M	20ME502.3	L2
10 (b)	A double riveted lap joint is made between 15-mm thick plates. The rivet diameter and pitch are 25 mm and 75 mm respectively. If the ultimate stresses are 400 MPa in tension, 320 MPa in shear and	6M	20ME502.3	L2

	640 MPa in crushing, find the minimum force per pitch which will rupture the joint. If the above joint is subjected to a load such that the factor of safety is two, find out the actual stresses developed in the plates and the rivets.			
<b>OR</b>				
11 (a)	What do you understand by the terms riveted joint and welded joints?	6M	20ME502.3	L2
11 (b)	Two plates 16 mm thick are joined by a double riveted lap joint. The pitch of each row of rivets is 90 mm. The rivets are 25 mm in diameter. The permissible stresses are 140 MPa in tension, 80 MPa in shear and 160 MPa in crushing. Find the efficiency of the joint.	6M	20ME502.3	L2
12 (a)	Write the applications of sleeve and cotter joint.	4M	20ME502.4	L2
12 (b)	Design a gib and cotter joint to carry a maximum load of 35 KN. Assuming that the gib, cotter and rod are of same material and have the following allowable stresses: $\sigma_t = 20$ MPa, $\tau = 15$ MPa, $\sigma_c = 50$ MPa.	8M	20ME502.4	L2
<b>OR</b>				
13 (a)	Describe the purpose of gib in cotter joint. What are the applications of cotter joints?	6M	20ME502.4	L2
13 (b)	Design a knuckle joint to transmit 150 kN. The design stresses may be taken as 75 MPa in tension, 60 MPa in shear and 150 MPa in compression.	6M	20ME502.4	L2
14 (a)	How do you specify a leaf spring and indicate the specification in a sketch?	4M	20ME502.5	L2
14 (b)	A helical spring is made from a wire of 6 mm diameter and has outside diameter of 75 mm. If the permissible shear stress is 350 MPa and modulus of rigidity 84 Kn/MM <sup>2</sup> , find the axial load which the spring can carry and the deflection per active turn.	8M	20ME502.5	L2
<b>OR</b>				
15 (a)	Define spring. What is the purpose of mechanical springs?	6M	20ME502.5	L2
15 (b)	A rail wagon of mass 20 tonnes is moving with a velocity of 2 m/s. It is brought to rest by two buffers with springs of 300 mm diameter. The maximum deflection of springs is 250 mm. The allowable shear stress in the spring material is 600 MPa. Design the springs for the buffers.	6M	20ME502.5	L2

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<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Common to All			<b>Academic Year</b>	2022- 2023
<b>Course Code</b>	20EEO01	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Introduction to Renewable Energy Sources (Open Elective)</b>						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>							
No.	Questions (1 through 5)					Learning Outcome (s)	DoK
1	Mention any 4 applications of solar energy					20EEO01.1	L1
2	List any 3 considerations for selecting a site for wind power plant					20EEO01.2	L1
3	List any 3 types of turbines considered for use in micro hydro resources					20EEO01.3	L1
4	Distinguish between a Bio-mass and Bio-gas					20EEO01.4	L2
5	List the major applications of Geo-thermal energy					20EEO01.5	L1
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>							
No.	Questions (6 through 15)	Marks				Learning Outcome (s)	DoK
6	Explain the following type of concentrating collectors a) line focusing type b) mirror strip type c) receiver pipe type d) point focusing type	12M				20EEO01.1	L2
<b>OR</b>							
7 (a)	Explain the V-I characteristics of a solar cell? And define fill factor & what is the significance of fill factor	6M				20EEO01.1	L2
7 (b)	Differentiate between conventional energy and non-conventional energy sources	6M				20EEO01.1	L2
8 (a)	Explain the working of (WECS) Wind energy conversion system. With main components	6M				20EEO01.2	L2
8 (b)	List any 6 main considerations for selecting a site for wind power plant.	6M				20EEO01.2	L2
<b>OR</b>							
9 (a)	Derive an expression for the total power of a wind stream taking in all consideration's m/sec, air density as	7M				20EEO01.2	L2
9 (b)	Find the maximum power output of a turbine if tip-speed is 10m/sec, air density as 1.4 kg/m <sup>3</sup> and rotor diameter as 64m	5M				20EEO01.2	L2
10	What is the basic principle of OTEC, discuss closed cycle system & write any 6 advantages & disadvantages	12M				20EEO01.3	L2
<b>OR</b>							
11 (a)	Draw the schematic diagram & explain the OTEC Open cycle system	6M				20EEO01.3	L2
11 (b)	Derive the expression for energy and power in a single basin system	6M				20EEO01.3	L2
12 (a)	What is meant by anaerobic digestion? What are the factors that affect bio-digestion? Explain briefly	6M				20EEO01.4	L2
12 (b)	List out various processes of Energy conversion from Bio-mass. Explain any one process	6M				20EEO01.4	L2
<b>OR</b>							
13 (a)	Describe the classification of Fuel cell? With a neat sketch explain the working of a fuel cell?	6M				20EEO01.4	L2
13 (b)	Explain the working of S.I engine and write any 4 advantages & disadvantages	6M				20EEO01.4	L2
14 (a)	What is Geo-thermal energy? Explain how geothermal energy can	6M				20EEO01.5	L2

	be utilized for electric power generation			
14 (b)	List out any 6 advantages and disadvantages of geothermal energy over other energy forms	6M	20EEO01.5	L1
<b>OR</b>				
15 (a)	Compare between Geothermal power plant and conventional thermal power plant	6M	20EEO01.5	L2
15 (b)	What is an Improved cooking stove (ICS)? And write any 6 benefits of improved cooking stoves over the traditional cooking stoves?	6M	20EEO01.5	L2

MODEL QP

## Semester End Examination, Nov./Dec., 2022

Degree	B. Tech. (U. G.)	Program	EEE			Academic Year	2022-2023
Course Code	20EE502	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Power Electronics						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Draw the turn – OFF characteristics of SCR.	20EE502.1	L2
2	What is the effect of source inductance in fully controlled bridge rectifier with continuous conduction?	20EE502.2	L1
3	Draw the circuit diagram of a 3-phase full wave uncontrolled rectifier.	20EE502.3	L1
4	Write the duty cycle in step up chopper operation.	20EE502.4	L1
5	Why a PWM inverter is superior to a square wave Inverter?	20EE502.5	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Draw the switching characteristics of power MOSFETs. Define turn-ON delay time, rise time, turn – ON time, turn- OFF delay time, fall time and turn- OFF time.	6M	20EE502.1	L2
6 (b)	What is the different turning – ON methods of a thyristor? Explain each method.	6M	20EE502.1	L2

OR

7 (a)	Draw the V-I characteristics of a thyristor and explain different operating regions. What is the effect of Gate current on the V-I characteristics of a thyristor.	6M	20EE502.1	L2
7 (b)	What is power MOSFET? What are the types of power MOSFET? Write the difference between general purpose MOSFET and power MOSFET	6M	20EE502.1	L2

8	What is phase angle-controlled technique? Explain the operation of single – phase angle-controlled rectifier. Derive the expression for average dc output voltage. Draw the relevant waveforms.	12M	20EE405.2	L2
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OR

9	A three –phase full converter is connected to a load resistance of 5 $\Omega$ and it is supplied from a 220 V, 50 Hz ac supply, If the firing angle of thyristor is $\alpha = 30^\circ$ Draw the relevant waveforms and determine i) average output voltage, ii) average output current, iii) rms output voltage and iv) rms output current.	12M	20EE502.2	L3
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10	Describe the operation of three phase full converter with RL load? Draw the waveforms by choosing firing angle such that output voltage has negative part.	12M	20EE502.3	L2
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OR

11 (a)	Describe working of 3-Phase AC-AC regulators with R load only and draw the relevant waveforms.	6M	20EE405.3	L2
11 (b)	A three-phase semi converter is connected to a RL load with $R=10 \Omega$ . If the firing angle of SCR is $\alpha = 60^\circ$ and it feeds 4 kW power to a resistive load determine the amplitude of maximum per phase input voltage.	6M	20EE405.3	L3

12	Explain the operating principle of dc chopper with a suitable diagram. Draw the voltage and current waveforms of chopper. Derive expressions for average output voltage and rms output voltage.	12M	20EE405.4	L2
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OR

13	With the help of a neat circuit diagram and associated waveforms, discuss the operation of Buck-Boost converter.	12M	20EE405.4	L2
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14	Explain the working of a 1-phase full bridge Inverter with RL load. Draw the relevant output waveforms.	12M	20EE405.5	L2
<b>OR</b>				
15 (a)	What are pulse width modulated inverters? What are the different PWM techniques used in inverter?	6M	20EE405.5	L2
15 (b)	A single-phase PWM inverter is fed from a 220 V dc supply and it is connected to a RL load with R=10 ohms and L=10 mH. Determine the total harmonic distortion in the load current. Assume width of each pulse is $\pi/2$ and the output frequency is 50 Hz.	6M	20EE405.5	L3

MODEL QP

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	EEE			<b>Academic Year</b>	2022- 2023
<b>Course Code</b>	20EE501	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Power Distribution and Distributed Generation</b>						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	Define coincidence factor.		20EE501.1	L1
2	What is the need of substation?		20EE501.2	L1
3	Define Load curve.		20EE501.3	L1
4	What are the advantages of ultra-capacitor?		20EE501.4	L1
5	List any two issues of economic aspects of distributed Generation.		20EE501.5	L1
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Obtain the relationship between the load factor and loss factor with different cases.	12M	20EE501.1	L2
<b>OR</b>				
7 (a)	Discuss about the load Modeling.	7M	20EE501.1	L2
7 (b)	A feeder supplies 2.5MW to an area. The total losses at peak loss are 120 kW and units supplied to that are during a year are 5.5 ×106. Determine the loss factor and average power loss.	5M	20EE501.1	L3
8	Compare the % voltage drop of the feeders with square type service area and hexagonal type service area.	12M	20EE501.2	L2
<b>OR</b>				
9 (a)	How is the rating of distribution substation decided? Explain.	7M	20EE501.2	L2
9 (b)	Explain the factors affecting the feeder voltage level.	5M	20EE501.2	L2
10	Explain the difference between Distributed Generation and Central Station Generation.	12M	20EE501.3	L2
<b>OR</b>				
11	Explain briefly about the concept of Distributed Generation.	12M	20EE501.3	L2
12	Explain the operation of a Lead acid battery and mention its merits and demerits.	12M	20EE501.4	L2
<b>OR</b>				
13	Describe the working principle and operation of ultra-capacitor with necessary diagram.	12M	20EE501.4	L2
14 (a)	What are the issues and challenges of Economic aspects of Distributed Generation?	6M	20EE501.5	L2
14 (b)	Describe the financial aspects of distributed Generation.	6M	20EE501.5	L2
<b>OR</b>				
15	Explain about Reliability evaluation of Distributed Generation based systems.	12M	20EE501.5	L2

## Semester End Examination, Nov./Dec., 2022

Degree	B. Tech. (U. G.)	Program	EEE			Academic Year	2022-2023
Course Code	20EE002	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Digital Control Systems						

Part A (Short Answer Questions 5 x 2 = 10 Marks)							
No.	Questions (1 through 5)		Learning Outcome (s)	DoK			
1	List any four advantages of digital systems.		20EE002.1	L1			
2	Compare the relationship between the Laplace transform and the Z-transform		20EE002.2	L2			
3	Write comment on the stability of $F(z) = z^2 - 0.25 = 0$ by using Jury's stability criterion?		20EE002.3	L2			
4	Recall controllability		20EE002.4	L2			
5	Write statement on necessary condition for design of state feedback controller through pole placement		20EE002.5	L2			
Part B (Long Answer Questions 5 x 12 = 60 Marks)							
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK			
6 (a)	Draw and explain the configuration of the basic digital control systems with neat block diagram	6M	20EE002.1	L2			
6 (b)	Analyse the reconstruction theorem for a sampled signal	6M	20EE002.1	L3			
OR							
7 (a)	List out any 4 applications where DCS are used? Explain any one of them in detail.	6M	20EE002.1	L1			
7 (b)	State and explain sampling theorem with neat sketch.	6M	20EE002.1	L3			
8 (a)	Define z-transform and write z transform for unit step function, Analyse the pulse transfer function of a Digital Control Systems	6M	20EE002.2	L2			
8 (b)	Obtain the Z-transform for the following signal by using method of solving difference equations? $X(n+2) + 4x(n+1) + 3x(n) = 2^n$ where $x(0)=0, x(1)=1$ .	6M	20EE002.2	L3			
OR							
9 (a)	State and explain the initial value and final value theorem of Z transforms	5M	20EE002.2	L2			
9 (b)	Find the inverse z-transform of $F(z) = \frac{z(z+1)}{(z-1)(z^2+3z+2)}$ by using partial fraction expansion method	7M	20EE002.2	L3			
10 (a)	Write about the primary strips and complementary strips with neat schematic diagram	6M	20EE002.3	L2			
10 (b)	Consider the following characteristic equation $F(z) = z^4 - 1.3z^3 + 0.4z^2 + 0.08z + 0.002 = 0$ , Determine whether or not any of the roots of the characteristic equation lie outside the unit circle in the z-plane. Use modified Routh's stability criterion.	6M	20EE002.3	L3			
OR							
11 (a)	Investigate the mapping from s-plane to z-plane of the constant frequency loci with neat sketch.	6M	20EE002.3	L2			
11 (b)	Consider the following characteristic equation $F(z) = z^4 - 1.2z^3 + 0.07z^2 + 0.3z - 0.08 = 0$ , Determine whether the system is stable or not? Use Jury's stability criterion?	6M	20EE002.3	L3			
12 (a)	Define State Transition matrix and write the properties of state transition matrix	6M	20EE002.4	L1			
12 (b)	Obtain the state transition matrix for the following system $\dot{X} = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix} X$ using Cayley Hamilton method	6M	20EE002.4	L2			
OR							
13 (a)	Explain about observable canonical form and controllable canonical	6M	20EE002.4	L2			

	form of state space representation			
13 (b)	Obtain the state transition matrix of the following discrete time system $x(k+1) = Gx(k) + Hu(k)$ $y(k) = Cx(k)$ <p>Where</p> $G = \begin{bmatrix} 0 & 1 \\ -0.16 & -1 \end{bmatrix}, H = \begin{bmatrix} 1 \\ 1 \end{bmatrix}, C = [1 \ 0]$	6M	20EE002.4	L2
14 (a)	Write statement on necessary condition for design of state feedback controller through pole placement	5M	20EE002.5	L2
14 (b)	Consider the system $X(k+1) = GX(k) + Hu(k)$ $G = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -0.12 & -0.01 & 1 \end{bmatrix}; H = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$ <p>Determine a suitable state feedback gain matrix 'K' such that the system will have the closed loop poles at 0.3, 0.4, 0.6.</p>	7M	20EE002.5	L2
<b>OR</b>				
15 (a)	What are the sufficient conditions for design of state feedback controller through pole placement?	6M	20EE002.5	L2
15 (b)	Consider the system is given by $X(k+1) = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -2 & -3 \end{pmatrix} (k) + \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} u(k)$ <p>Determine a suitable state feedback gain matrix 'K' to place the eigen values at 0.5, 0.6, 0.7.</p>	6M	20EE002.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	EEE			<b>Academic Year</b>	2022-2023
<b>Course Code</b>	20EC305	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Digital System Design</b>						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	List any two number systems		20EC305.1	L2
2	State the Duality theorem.		20EC305.2	L1
3	What is a Combinational Logic Circuit? Give an example.		20EC305.3	L1
4	Recall PAL.		20EC305.4	L2
5	List any 2 differences between Latch and Flip- Flop.		20EC305.5	L1
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Perform the Excess-3 Addition for 43 & 56.	6M	20EC305.1	L2
6 (b)	Perform the BCD Subtraction for 856 & 523.	6M	20EC305.1	L2
<b>OR</b>				
7 (a)	Perform the Excess- 3 Subtraction for 78 & 62.	6M	20EC305.1	L2
7 (b)	Perform the BCD Subtraction for 687 & 482.	6M	20EC305.1	L2
8 (a)	Explain all the Logic Gates with their Symbol and Truth Table.	6M	20EE405.2	L2
8 (b)	Simplify the following Boolean Expression using k-map Technique. $f(A,B,C,D)=\sum m(1,3,7,11,15)+\sum d(0,2,4)$	6M	20EE405.2	L2
<b>OR</b>				
9 (a)	Design a Binary to BCD Code Converter and draw the logic diagram.	6M	20EC305.2	L3
9 (b)	Design a 4-bit Binary to Gray Code Converter and draw the logic diagram.	6M	20EC305.2	L3
10(a)	Explain 4-bit Binary Adder/Subtractor circuit with the help of a diagram.	6M	20EC305.3	L2
10 (b)	Explain the working of Decade Counter and draw the diagram.	6M	20EC305.3	L2
<b>OR</b>				
11 (a)	Design a Full Adder using two Half Adders.	6M	20EE405.3	L3
11 (b)	Explain the working of Look-ahead-Carry Adder with the help of a neat diagram.	6M	20EE405.3	L2
12 (a)	Write the differences between Combinational circuits and Sequential circuits.	6M	20EE405.4	L2
12 (b)	Explain the working of Master Slave JK Flip Flop and draw the diagram.	6M	20EE405.4	L2
<b>OR</b>				
13 (a)	Draw the Excitation Tables of S-R, J-K, D and T Flip-Flops.	6M	20EE405.4	L2
13 (b)	Convert S-R Flip-Flop to J-K Flip-Flop.	6M	20EE405.4	L2
14 (a)	Explain the working of Universal Shift Register with the help of a diagram.	6M	20EE405.5	L2
14 (b)	Explain the working of Johnson Counter with a neat diagram.	6M	20EE405.5	L2
<b>OR</b>				
15 (a)	Explain VHDL programming using structural modeling.	6M	20EE405.5	L2
15 (b)	Draw and explain Design flow of VHDL.	8M	20EE405.5	L2

## Semester End Examination, Nov./Dec., 2022

Degree	B. Tech. (U. G.)	Program	ECE			Academic Year	2022 - 2023
Course Code	20EC502	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Linear and Digital IC Applications						

Part A (Short Answer Questions 5 x 2 = 10 Marks)				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	Sketch the input output waveforms of an inverting comparator		20EC502.1	L2
2	Write the two applications of VCO		20EC502.2	L1
3	Find out the resolution and of a D/A Converter if the maximum peak to peak output voltage is 5V and the input signal is a 10 bit word.		20EC502.3	L3
4	State the logic levels and noise margin of CMOS Circuits		20EC502.4	L1
5	Write modes of Shift Registers		20EC502.5	L1
Part B (Long Answer Questions 5 x 12 = 60 Marks)				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Draw the circuit diagram of Logarithmic Amplifier and explain its operation	6M	20EC502.1	L2
6 (b)	For the given output expression design an adder circuit using an Op-Amp. ( $V_0 = -(0.1V_1 + V_2 + 10V_3)$ )	6M	20EC502.1	L3
OR				
7 (a)	Discuss the DC & AC characteristics of Op-Amps	6M	20EC502.1	L2
7 (b)	Explain the Monostable Multivibrator using Op-Amp and sketch input and output waveforms.	6M	20EC502.1	L2
8 (a)	Explain the working of Astable Multivibrator using 555 timer with relevant circuit and Waveforms and derive the expression for frequency of operation and duty cycle	6M	20EC502.2	L2
8 (b)	Design a 555 based Astable Multivibrator to generate an output signal with frequency 2KHz and duty cycle of 75% ( $C=0.1\mu F$ )	6M	20EC502.2	L3
OR				
9 (a)	Derive an expression for the lock-in range of a PLL	6M	20EC502.2	L3
9 (b)	With neat functional diagram explain the operation of VCO and derive an expression for free running frequency, $f_0$	6M	20EC502.2	L2
10 (a)	Explain counter type ADC.	6M	20EC502.3	L2
10 (b)	Define the following terms related to ADC i) Conversion time ii) Percentage resolution iii) Linearity	6M	20EC502.3	L1
OR				
11 (a)	Explain the R-2R type DAC with necessary equations and write its advantages and disadvantages	6M	20EC502.3	L2

11 (b)	Explain successive Approximation ADC with neat sketch	6M	20EC502.3	L2
12 (a)	Discuss and the steady state Electrical behavior of CMOS with resistive loads.	8M	20EC502.4	L2
12 (b)	Design 2 input XOR gate and explain the circuit with function table	4M	20EC502.4	L3
<b>OR</b>				
13 (a)	Discuss and the dynamic Electrical behavior of CMOS circuit	6M	20EC502.4	L2
13 (b)	Design a 3 Input NAND gate and explain the circuit with functional table	6M	20EC502.4	L3
14 (a)	Discuss the pin significance of 3 to 8 Decoder (IC74138)	6M	20EC502.5	L2
14 (b)	Explain 4 bit parallel adder and design 8 bit parallel adder	6M	20EC502.5	L2
<b>OR</b>				
15	Explain the concept of Universal Shift Register with necessary diagrams	12M	20EC502.5	L2

## Semester End Examination, Nov./Dec., 2022

Degree	B. Tech. (U. G.)	Program	ECE			Academic Year	2022 - 2023
Course Code	20EC006	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Electronic Measurements & Instrumentation						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define precision and accuracy	20EC006.1	L1
2	List four applications of Spectrum Analyzer	20EC006.2	L1
3	What is dual trace oscilloscope?	20EC006.3	L1
4	Write four applications of bridges	20EC006.4	L1
5	Define transducer	20EC006.5	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Define the following terms a) Fidelity b) Speed of response c) Lag d) Dynamic error	6M	20EC006.1	L2
6 (b)	Classify and explain thermocouple type ammeter	6M	20EC006.1	L2
<b>OR</b>				
7 (a)	Explain average responding voltmeter with neat diagram	6M	20EC006.1	L2
7 (b)	Describe the operation of series type ohmmeter	6M	20EC006.1	L2
8 (a)	Describe the working of AF sine and square wave generator	6M	20EC006.2	L2
8 (b)	Draw the block diagram and explain the working of function generator	6M	20EC006.2	L3
<b>OR</b>				
9 (a)	Explain the working of AF wave analyzer with neat sketch	6M	20EC006.2	L2
9 (b)	Explain the working of RF Spectrum Analyzer with neat block diagram	6M	20EC006.2	L3
10 (a)	Draw the block diagram of general purpose CRO and explain its working	6M	20EC006.3	L2
10 (b)	Draw the block diagram of Sampling oscilloscope and explain its working	6M	20EC006.3	L2
<b>OR</b>				
11 (a)	Explain about storage oscilloscope with block diagram	6M	20EC006.3	L3
11 (b)	Explain the method of finding phase relationship of two waveforms using Lissajous figure	6M	20EC006.3	L2
12 (a)	Derive the expression for unknown inductance using Maxwell Bridge	7M	20EC006.4	L3
12 (b)	A Maxwell bridge is used to measure inductive impedance. The bridge constants at balance are $C_1=0.01\mu\text{F}$ , $R_1=470\text{k}\Omega$ , $R_2=5.1\text{k}\Omega$ and $R_3=100\text{k}\Omega$ . Find the series equivalent of the unknown impedance?	5M	20EC006.4	L4

<b>OR</b>				
13 (a)	How the unknown frequency is measured using Wein's bridge method?	7M	20EC006.4	L3
13 (b)	In the case of a Schering Bridge, arm AC has $R=4.7\text{ k}\Omega$ ; Arm CD has unknown elements. Arm BD has $C=0.1\text{ }\mu\text{F}$ ; Arm AB= $4.7\text{ k}\Omega$ is shunt with $1\mu\text{F}$ . Determine values of components are the arm CD.	5M	20EC006.4	L4
<b>OR</b>				
14 (a)	Explain the Principle and working of Strain gauges	6M	20EC006.5	L3
14 (b)	Explain the principle, working, construction, Characteristics and applications of LVDTs	6M	20EC006.5	L2
<b>OR</b>				
15 (a)	Explain the operation of a Piezo electric transducer	6M	20EC006.5	L2
15 (b)	Explain general Data Acquisition System (DAS) with a Neat block diagram?	6M	20EC006.5	L2

## Semester End Examination, Nov./Dec., 2022

Degree	B. Tech. (U. G.)	Program	ECE			Academic Year	2022 - 2023
Course Code	20EC503	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Antennas & Wave Propagation						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is polarization? List out three types of polarizations.	20EC503.1	L1
2	What are various forms of Antenna Arrays?	20EC503.2	L1
3	What are the applications of spiral antenna?	20EC503.3	L1
4	What is zoning?	20EC503.4	L1
5	Define MUF.	20EC503.5	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What is Radiation Pattern explain with Neat Diagrams	6M	20EC503.1	L2
6 (b)	Derive the relationship between max effective aperture (Ae) and Directivity (D).	6M	20EC503.1	L3
<b>OR</b>				
7 (a)	Derive Friss transmission equation	6M	20EC503.1	L3
7 (b)	Explain Radiation mechanism in single wire and two wire	6M	20EC503.1	L2
8	Derive the field equations (E&M fields) of a $\lambda/2$ dipole antenna.	12M	20EC503.2	L3
<b>OR</b>				
9 (a)	Explain in detail about Broadside and End-fire arrays.	6M	20EC503.2	L2
9 (b)	With neat sketch explain the design of Binomial array	6M	20EC503.2	L3
10 (a)	Explain the Design and construction of Helical Antenna.	6M	20EC503.3	L2
10 (b)	Briefly explain about Corner Reflectors.	6M	20EC503.3	L2
<b>OR</b>				
11 (a)	Explain about construction of Spiral Antenna.	6M	20EC503.3	L3
11 (b)	What are different types of feed mechanism used in parabolic reflector antenna?	6M	20EC503.3	L2
12 (a)	Explain about Geometry and features of Lens antenna	7M	20EC503.4	L2
12 (b)	Briefly explain about different types of smart antennas.	5M	20EC503.4	L2
<b>OR</b>				
13 (a)	Explain the measurement of i) Radiation pattern ii) Gain	7M	20EC503.4	L2
13 (b)	Write briefly about smart antennas	5M	20EC503.4	L2
14 (a)	Write short notes on Ground Wave Propagation	6M	20EC503.5	L2
14 (b)	Derive the LOS distance in space wave propagation	6M	20EC503.5	L3
<b>OR</b>				
15 (a)	Explain in detail about sky wave propagation.	6M	20EC503.5	L2
15 (b)	Explain the following terms: (i) Critical Frequency (ii) Skip Distance (iii) Virtual Height	6M	20EC503.5	L2

## Semester End Examination, Nov./Dec., 2022

Degree	B. Tech. (U. G.)	Program	ECE			Academic Year	2022 - 2023
Course Code	20EC501	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Analog and Digital Communications						

Part A (Short Answer Questions 5 x 2 = 10 Marks)				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	What is the need for Modulation?		20EC501.1	L1
2	What is Carson's rule? Why it is used?		20EC501.2	L1
3	What is the difference between PCM and DPCM?		20EC501.3	L1
4	Draw the PSD of ASK signal.		20EC501.4	L2
5	Define information rate.		20EC501.5	L1
Part B (Long Answer Questions 5 x 12 = 60 Marks)				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain the generation technique of an AM wave using the square law modulator.	7M	20EC501.1	L2
6 (b)	Compare AM, D.S.B-SC and S.S.B-SC transmission.	5M	20EC501.1	L2
OR				
7 (a)	What are DSB-SC generation methods? Explain the generation of DSB-SC using Ring modulator	6M	20EC501.1	L2
7 (b)	An amplitude modulated signal represented in time domain as $4\cos(1800\pi t) + 10\cos(2000\pi t) + 4\cos(2200\pi t)$ . Sketch the spectrum and calculate the band width and total power.	6M	20EC501.1	L3
8	Briefly explain about the spectra of NBFM & WBFM.	12M	20EC501.2	L3
OR				
9 (a)	Draw the block diagram of Super-heterodyne Receiver and explain each block.	6M	20EC501.2	L2
9 (b)	Show that Narrow band FM is equivalent to AM with respect to transmission bandwidth.	6M	20EC501.2	L3
10 (a)	Derive the expression for the output signal to quantization noise ratio in PCM.	7M	20EC501.3	L3
10 (b)	Define the following terms (a) Sampling Theorem (b) Quantization (c) Quantization Error (d) Encoder,	5M	20EC501.3	L1
OR				
11 (a)	With a neat sketch explain the principle and operation of Delta Modulation.	6M	20EC501.3	L2
11 (b)	Consider a DM system designed to accommodate analog message signals limited to a bandwidth, $w=5$ kHz. A sinusoidal test signal of amplitude $A=1$ V and frequency $f_m=1$ kHz is applied to the system. The sampling rate of the system is 50 kHz. i) Calculate the step size required to minimize slope overload. ii) Calculate the signal to quantization noise ratio of the system for the specified Sinusoidal test signal.	6M	20EC501.3	L3

12 (a)	With a neat sketch, explain the non-coherent detection of FSK.	6M	20EC501.4	L2
12 (b)	Explain the Generation and Detection of QPSK Signals with the help of Block Diagram and mathematical descriptions.	6M	20EC501.4	L2
<b>OR</b>				
13 (a)	When the input noise is white, show that the impulse response of matched filter is $h(t) = K(t - t_0)$ , where $K$ is a positive real constant and $t_0$ is the input signal.	6M	20EC501.4	L3
13 (b)	Derive an expression for probability of error of BPSK modulation scheme.	6M	20EC501.4	L3
14 (a)	Explain the concept of entropy and its properties.	6M	20EC501.5	L2
14 (b)	Show that $H(X, Y) = H(X) + H(Y X) = H(Y) + H(X Y)$ .	6M	20EC501.5	L3
<b>OR</b>				
15 (a)	Explain the Huffman coding in detail along with example.	6M	20EC501.5	L2
15 (b)	Apply Shanon-Fano coding to the source with 8 emitting messages having probabilities $\frac{1}{2}, \frac{3}{20}, \frac{3}{20}, \frac{2}{25}, \frac{2}{25}, \frac{1}{50}, \frac{1}{100}$ and $\frac{1}{100}$ respectively, and find the coding efficiency.	6M	20EC501.5	L3

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Common to All			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20ECO01	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	Architectures and Algorithms of IoT (Open Elective)						

## Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is IoT?	20ECO01.1	L1
2	What is Security?	20ECO01.1	L1
3	Define a Duty cycle	20ECO01.3	L1
4	List any four types of Network Models	20ECO01.2	L1
5	Define IIoT	20ECO01.2	L1

## Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 11)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain the applications of IoT	6M	20ECO01.1	L2
6 (b)	Explain the Architecture of IoT	6M	20ECO01.1	L2
<b>OR</b>				
7 (a)	Explain the Wireless Networks in IoT	6M	20ECO01.1	L2
7 (b)	Describe the Security and privacy in IoT	6M	20ECO01.1	L2
8 (a)	Describe the Data Bases in IoT	6M	20ECO01.2	L2
8 (b)	Explain the protocol concept in IoT	6M	20ECO01.2	L2
<b>OR</b>				
9	Classify and explain the IoT oriented protocols	12M	20ECO01.2	L2
10 (a)	Describe the operation of IoT device design space	6M	20ECO01.3	L2
10 (b)	Explain the Cost of ownership and power consumption in IoT	6M	20ECO01.3	L2
<b>OR</b>				
11 (a)	Explain the Cost per Transistor and chip size in IoT	6M	20ECO01.3	L2
11 (b)	Describe the Duty cycle and power consumption in IoT	6M	20ECO01.3	L2
12 (a)	Explain the Network model and Events in IoT	6M	20ECO01.4	L2
12 (b)	Describe the IoT Event analysis	6M	20ECO01.4	L2
<b>OR</b>				
13 (a)	Explain the Environmental Interaction modelling Of IoT	6M	20ECO01.4	L2
13 (b)	Describe the Network models and Physical networks in IoT	6M	20ECO01.4	L2
14	Explain the Basic Technologies, applications and challenges of IIoT	12M	20ECO01.5	L2
<b>OR</b>				
15	Draw and Explain Architecture of IIoT	12M	20ECO01.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	CSE (DS)			<b>Academic Year</b>	2022 – 2023
<b>Course Code</b>	20AI603	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Machine Learning</b>						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>							
No.	Questions (1 through 5)					Learning Outcome (s)	DoK
1	Compare Supervised and unsupervised learning.					20AI603.1	L2
2	Define discriminative learning.					20AI603.4	L1
3	What is a decision tree?					20AI603.2	L1
4	Define perceptron.					20AI603.3	L1
5	What is a bagging?					20AI603.5	L1
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>							
No.	Questions (6 through 15)		Marks			Learning Outcome (s)	DoK
6 (a)	What are the different types of a Machine Learning models?		6M			20AI603.1	L2
6 (b)	Explain about Feature Construction and Transformation.		6M			20AI603.1	L2
<b>OR</b>							
7 (a)	Write a detailed note on Regression.		6M			20AI603.1	L2
7 (b)	Explain about binary classification in detail.		6M			20AI603.1	L2
8 (a)	Discuss in detail about Learning Ordered Rule Lists.		6M			20AI603.2	L2
8 (b)	What exactly is concept learning? Explain in detail.		6M			20AI603.2	L2
<b>OR</b>							
9 (a)	Explain in detail about descriptive rule learning.		6M			20AI603.2	L2
9 (b)	Discuss in detail about Learning Unordered Rule Lists.		6M			20AI603.2	L2
10 (a)	Describe Nearest-Neighbor Classification in detail.		6M			20AI603.3	L2
10 (b)	Explain in detail about K-means algorithm.		6M			20AI603.3	L2
<b>OR</b>							
11 (a)	Explain the least square method.		6M			20AI603.3	L2
11 (b)	Give a brief note on Support vector machines.		6M			20AI603.3	L2
12 (a)	Explain about normal distribution with the help of sample data.		6M			20AI603.4	L2
12 (b)	Explain the naïve bayes model for classification.		6M			20AI603.4	L2
<b>OR</b>							
13 (a)	Explain probabilistic models with hidden variables.		6M			20AI603.4	L2
13 (b)	Explain Compression based models.		6M			20AI603.4	L2
14 (a)	Define Q learning? Explain with an example about Q-learning		6M			20AI603.5	L2
14 (b)	Write detailed note on Feature Transformations.		6M			20AI603.5	L2
<b>OR</b>							
15 (a)	Explain the kinds of features.		6M			20AI603.5	L2
15 (b)	Explain about bagging and random forest in detail.		6M			20AI603.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	CSE (DS)			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20CS005	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Mobile Computing</b>						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Mobile Computing	20CS005.1	L1
2	Define GPRS	20CS005.1	L1
3	What is Tunneling?	20CS005.3	L1
4	What is TCP/IP?	20CS005.4	L1
5	What is data dissemination?	20CS005.5	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain mobile computing architecture.	6M	20CS005.1	L2
6 (b)	Write the novel applications of mobile computing.	6M	20CS005.1	L2
<b>OR</b>				
7 (a)	Explain Radio Interface with neat diagram.	6M	20CS005.1	L2
7 (b)	What is GPRS? Explain.	6M	20CS005.1	L2
8 (a)	What is CDMA? Explain.	6M	20CS005.2	L2
8 (b)	Explain Near and Far, Hidden and Exposed Terminals.	6M	20CS005.2	L2
<b>OR</b>				
9 (a)	Differentiate between CDMA, TDMA, DMA and FDMA.	6M	20CS005.2	L2
9 (b)	Explain Wireless LAN(IEE 802.11).	6M	20CS005.2	L2
10 (a)	Explain Packet Delivery and Handover Management.	7M	20CS005.3	L2
10 (b)	Explain Tunneling and Encapsulation.	5M	20CS005.3	L2
<b>OR</b>				
11 (a)	What is DHCP? Explain.	7M	20CS005.3	L2
11 (b)	Explain Route Optimization.	5M	20CS005.3	L2
12 (a)	What is TCP? Explain Indirect TCP.	5M	20CS005.4	L2
12 (b)	Explain Client Server Computing and Adaptation.	7M	20CS005.4	L2
<b>OR</b>				
13 (a)	Explain Mobile TCP.	6M	20CS005.4	L2
13 (b)	What is Query processing? Explain.	6M	20CS005.4	L2
14 (a)	Explain Classification of data delivery mechanism.	6M	20CS005.5	L1,L2
14 (b)	What is selective tuning and indexing methods? Explain.	6M	20CS005.5	L1,L2
<b>OR</b>				
15 (a)	What is Data dissemination? Explain.	6M	20CS005.5	L2
15 (b)	Explain Broadcast Models.	6M	20CS005.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Common to All			<b>Academic Year</b>	2022 – 2023
<b>Course Code</b>	20DSO01	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Introduction to Database Management Systems (Open Elective)</b>						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>							
No.	Questions (1 through 5)			Learning Outcome (s)	DoK		
1	What is a weak entity in ER diagram?			20DSO01.1	L1		
2	How does left outer join works?			20DSO01.2	L1		
3	Write any two differences between Triggers and Integrity Constraints.			20DSO01.4	L2		
4	Define Null Values.			20DSO01.3	L1		
5	What is lossless join? How it is achieved?			20DSO01.5	L1		
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>							
No.	Questions (6 through 15)	Marks		Learning Outcome (s)	DoK		
6 (a)	With a neat diagram, explain the structure of Database Management System.	6M		20DSO01.1	L2		
6 (b)	Consider the Bank Management System. account(account_number, branch_name, balance) branch (branch_name, branch_city, assets) customer (customer_name customer_street, customer_city) loan (loan_number, branch_name, amount) depositor((customer_name, account_number) borrower(customer_name, loan_number) Based on the above schema, write the corresponding SQL queries for the following: i) For all customers who have a loan from the bank, find their names, loan numbers, and loan amount. ii) Find the customer names, loan numbers, and loan amounts, for all loans at the Perryridge branch. iii) Find the names of all branches that have assets greater than those of at least one branch located in Brooklyn. iv) Find the average account balance of those branches where the account balance is greater than Rs. 1200. v) Find the maximum across all branches of the total balance at each branch.	6M		20DSO01.1	L3		
<b>OR</b>							
7 (a)	Differentiate File systems from DBMS.	4M		20DSO01.1	L2		
7 (b)	Explain in detail about ER model in detail.	8M		20DSO01.1	L2		
8 (a)	What is JOIN operator in DBMS? Explain all the variations of the JOIN operation in relational algebra with a suitable example.	6M		20DSO01.2	L2		
8 (b)	Explain any four SQL Aggregate operators with an example.	6M		20DSO01.2	L2		
<b>OR</b>							
9	Consider the Bank Management System. account(account_number, branch_name, balance) branch (branch_name, branch_city, assets) customer (customer_name customer_street, customer_city) loan (loan_number, branch_name, amount) depositor((customer_name, account_number) borrower(customer_name, loan_number) Based on the above schema, write the corresponding SQL queries for the following? i) For all customers who have a loan from the bank, find their names, loan numbers, and loan amount. ii) Find the customer names, loan numbers, and loan amounts, for all loans at the Perryridge branch. iii) Find the names of all branches that have assets greater than those of at least one branch located in Brooklyn. iv) Find the average account balance of those branches	12M		20DSO01.2	L3		

	v) where the account balance is greater than Rs. 1200. Find the maximum across all branches of the total balance at each branch.			
10 (a)	Explain in detail about DDL commands in SQL	6M	20DSO01.3	L2
10 (b)	Explain in detail about DML commands in SQL	6M	20DSO01.3	L2
<b>OR</b>				
11 (a)	Discuss in detail about set operators	6M	20DSO01.3	L2
11 (b)	Write a short note on referential integrity constraints in SQL	6M	20DSO01.3	L2
12 (a)	Explain the components of PL/SQL block	6M	20AI603.4	L2
12 (b)	Explain about conditional statements in PL/SQL block	6M	20AI603.4	L2
<b>OR</b>				
13 (a)	Explain about control statements in PL/SQL block	8M	20AI603.4	L2
13 (b)	Write a short note on triggers	4M	20AI603.4	L2
14 (a)	Differentiate trivial and nontrivial dependencies	6M	20AI603.5	L2
14(b)	What is dependency preservation property for decomposition? Explain why it is important	6M	20AI603.5	L2
<b>OR</b>				
15 (a)	Given a Relation R=(X,Y,Z) and Functional Dependencies are F={ {X,Y}→{Z}, {Z}→{X} } Determine all Candidate keys of R and the normal form of R with proper explanation	6M	20AI603.5	L3
15 (b)	Explain in detail about normalization	6M	20AI603.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	CSE (Data Science)			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20DS502	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Big Data</b>						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	State the reason why we can't perform aggregation in mapper phase? Why do we need reducer for this?	20DS502.1	L1
2	How is HDFS fault-tolerant?	20DS502.2	L1
3	What is lazy evaluation in Spark?	20DS502.3	L1
4	What is RDD lineage graph?	20DS502.4	L1
5	What are the ACID transactions in HIVE?	20DS502.5	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What is Big Data? Explain the 5Vs with examples.	5M	20DS502.1	L2
6 (b)	What are the building blocks of Hadoop? Explain its functions.	7M	20DS502.1	L2
<b>OR</b>				
7 (a)	Explain in detail about Google File System.	7M	20DS502.1	L2
7 (b)	Discuss few conventional challenges in Big Data.	5M	20DS502.1	L2
8 (a)	How can a client read a file "example.txt" in HDFS with file size of 248MB?	5M	20DS502.2	L2
8 (b)	Explain the storage unit in Hadoop.	7M	20DS502.2	L2
<b>OR</b>				
9 (a)	What are the different types of Hadoop configuration files? Discuss.	5M	20DS502.2	L2
9 (b)	Explain functionality of map () function and reduce () function with a neat diagram in a MapReduce context.	7M	20DS502.2	L2
10 (a)	What are the important components of Spark ecosystem?	5M	20DS502.3	L1
10 (b)	Explain how Spark runs applications with the help of its architecture.	7M	20DS502.3	L2
<b>OR</b>				
11 (a)	Discuss Spark Streaming with suitable example such as analyzing tweets from Twitter.	7M	20DS502.3	L2
11 (b)	Explain graphical representation of DataFrames in Spark.	5M	20DS502.3	L2
12 (a)	What are the operations that you can perform on RDD?	7M	20DS502.4	L1
12 (b)	Explain the concept of Resilient Distributed Datasets.	5M	20DS502.4	L2
<b>OR</b>				
13 (a)	What are Pair RDDs?	4M	20DS502.4	L1
13 (b)	Explain Partitions & its types.	8M	20DS502.4	L2
14 (a)	Discuss Hive architecture.	7M	20DS502.5	L2
14 (b)	How to create & drop table in Hive?	5M	20DS502.5	L2
<b>OR</b>				

15(a)	What kind of data warehouse application is suitable for Hive? What are the types of tables in Hive?	5M	20DS502.5	L1
15 (b)	What are the components used in Hive Query Processor?	7M	20DS502.5	L1

MODEL QP

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	CSE (AI & ML)/CSE (DS)			<b>Academic Year</b>	2022 – 2023
<b>Course Code</b>	20CS405	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	Theory of Computation						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define grammar and state 4 different types of grammars.	20CS405.1	L1
2	Define Ambiguous Grammar	20CS405.2	L1
3	Define Turing Machine	20CS405.3	L1
4	List the 6 phases of a compiler	20CS405.4	L1
5	Define loop optimization	20CS405.5	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain about NFA and DFA with examples.	6M	20CS405.1	L2
6 (b)	Construct an NFA for the set of all strings with 3 consecutive ones	6M	20CS405.1	L2
<b>OR</b>				
7 (a)	Convert the following regular expression into Finite Automata. $10+01^*$	6M	20CS405.1	L2
7 (b)	Explain Moore and Mealy machines with examples	6M	20CS405.1	L2
8 (a)	Convert the given CFG to CNF $S \rightarrow a \mid aA \mid B$ $A \rightarrow aBB \mid \epsilon$ $B \rightarrow Aa \mid b$	6M	20CS405.2	L3
8 (b)	Construct PDA for the language which contains equal number of a's and equal number of b's	6M	20CS405.2	L3
<b>OR</b>				
9 (a)	Let G be the grammar $S \rightarrow 0B \mid 1A$ $A \rightarrow 0/0S/1AA, B \rightarrow 1/1S/0BB$ For the string 00110101. Find a) Left most derivation b) Right most derivation Derivation Tree	6M	20CS405.2	L2
9 (b)	Define context free grammar and Eliminate useless symbols from the grammar $S \rightarrow aAa, A \rightarrow bBB, B \rightarrow ab, C \rightarrow aB$	6M	20CS405.2	L2
10 (a)	Draw block diagram of Turing Machine	6M	20CS405.3	L2
10 (b)	Design a Turing Machine for the language $L = \{a^n b^n / n \geq 1\}$	6M	20CS405.3	L3
<b>OR</b>				
11 (a)	Explain Universal Turing Machine	6M	20CS405.3	L2
11 (b)	Explain classes of P and NP Problems	6M	20CS405.3	L2
12 (a)	Explain structure of a compiler	6M	20CS405.4	L2
12 (b)	Explain LR1 parser	6M	20CS405.4	L2
<b>OR</b>				
13 (a)	Explain about lexical analysis role	6M	20CS405.4	L2
13 (b)	Explain syntax directed transactions	6M	20CS405.4	L2
14 (a)	Explain 3 address code	6M	20CS405.5	L2
14 (b)	Explain principle sources of optimization		20CS405.5	L2
<b>OR</b>				
15 (a)	Explain about peephole optimization	6M	20CS405.5	L2
15 (b)	Explain basic blocks and flow blocks	6M	20CS405.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Common to All			<b>Academic Year</b>	2022 – 2023
<b>Course Code</b>	20AIO01	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Machine Learning for Engineers (Open Elective)</b>						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	Define learning system and write any two issues of learning system		20AIO01.1	L1
2	What is curse of Dimensionality?		20AIO01.2	L1
3	What is Bagging?		20AIO01.3	L1
4	What is iso-map?		20AIO01.4	L1
5	What is sampling?		20AIO01.5	L1
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What are the five steps involved in designing a learning system explain in detail	8M	20AIO01.1	L1
6 (b)	What is supervised learning?	4M	20AIO01.1	L1
<b>OR</b>				
7 (a)	Explain the different types of machine learning technique	6M	20AIO01.1	L2
7 (b)	What is Linear Separability and linear regression?	6M	20AIO01.1	L1
8 (a)	Give a brief note on Support Vector Machine	6M	20AIO01.2	L2
8 (b)	Explain in detail about RBF network	6M	20AIO01.2	L2
<b>OR</b>				
9 (a)	Discuss in detail about back propagation error	6M	20AIO01.2	L2
9 (b)	Write about interpolations and basis function	6M	20AIO01.2	L2
10 (a)	Discuss in detail decision trees construction	6M	20AIO01.3	L2
10 (b)	What is classification? Explain in detail about regression trees	6M	20AIO01.3	L2
<b>OR</b>				
11 (a)	Explain about Gaussian mixture models	6M	20AIO01.3	L2
11 (b)	Explain about k-means algorithm with example	6M	20AIO01.3	L2
12 (a)	Explain about genetic algorithms	6M	20AIO01.4	L2
12 (b)	Give a brief note on least square optimization	6M	20AIO01.4	L2
<b>OR</b>				
13 (a)	What is principal component analysis, explain in detail	6M	20AIO01.4	L2
13 (b)	Explain in detail about locality linear embedding	6M	20AIO01.4	L2
14 (a)	Write about proposal distribution	6M	20AIO01.5	L2
14 (b)	Explain graphical models	6M	20AIO01.5	L2
<b>OR</b>				
15 (a)	Explain hidden Markov models	6M	20AIO01.5	L2
15 (b)	Write about Bayesian networks	6M	20AIO01.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	CSE (AI & ML)			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20AI503	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>High Performance Computing</b>						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	What is texture memory?		20AI503.1	L1
2	Recall Multicore architectures		20AI503.2	L2
3	List any five applications of CUDA		20AI503.3	L1
4	What is a kernel?		20AI503.4	L1
5	What is meant by heterogeneous cluster?		20AI503.5	L2
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain different kinds of CUDA memory	8M	20AI503.1	L2
6 (b)	What is CUDA? Draw and explain CUDA architecture	4M	20AI503.1	L2
<b>OR</b>				
7	Give an overview of the taxonomy of parallel architectures	12M	20AI503.1	L2
8 (a)	What is resource contention and mention various problems of resource contention that affects the level of performance	8M	20AI503.2	L1
8 (b)	Explain the characteristics of GPU	4M	20AI503.2	L2
<b>OR</b>				
9	Explain any three data decomposition techniques with examples	12M	20AI503.2	L2
10 (a)	What is meant by synchronization and explain about implicit and explicit synchronization	8M	20AI503.3	L2
10 (b)	What are the issues in sorting on parallel programming?	4M	20AI503.3	L2
<b>OR</b>				
11 (a)	How do you measure performance of parallel processors?	8M	20AI503.3	L2
11 (b)	Explain different types of errors in cuda	4M	20AI503.3	L2
12 (a)	Explain about memory consistency models	8M	20AI503.4	L2
12 (b)	Design a simple CUDA kernel function to multiply two integers	4M	20AI503.4	L2
<b>OR</b>				
13 (a)	What is pipelining? Mention different stages of pipelined architecture	8M	20AI503.4	L1
13 (b)	Explain any four instructions in OPENCL	4M	20AI503.4	L2
14 (a)	Illustrate sparse matrix multiplication in parallel programming	8M	20AI503.5	L2
14 (b)	Discuss marshalling in MPI	4M	20AI503.5	L2
<b>OR</b>				
15	Explain parallel matrix-multiplication algorithm with an example	12M	20AI503.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	CSE (AI & ML)			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20AI003	<b>Test Duration</b>	3 Hrs.	<b>Max. Marks</b>	70	<b>Semester</b>	V
<b>Course</b>	Cloud Computing Essentials						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What do you mean by elasticity in cloud computing?	20AI003.1	L1
2	Define hypervisor. List types of hypervisors	20AI003.2	L1
3	Define SaaS, PaaS and IaaS.	20AI003.3	L1
4	List any 4 cloud security challenges	20AI003.4	L1
5	What is Open Stack?	20AI003.5	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain different characteristics of cloud computing	6M	20AI003.1	L2
6 (b)	Explain the principles of parallel computing	6M	20AI003.1	L2
<b>OR</b>				
7 (a)	Explain the principles of distributed computing	6M	20AI003.1	L2
7 (b)	Explain on demand provisioning in cloud computing	6M	20AI003.1	L2
8 (a)	Explain service oriented architecture with a neat sketch.	5M	20AI003.2	L2
8 (b)	Explain implementation levels of virtualization.	7M	20AI003.2	L2
<b>OR</b>				
9 (a)	Explain virtualization of CPU, Memory and I/O devices	6M	20AI003.2	L2
9 (b)	What is Publish-Subscriber model? Explain the different components in it	6M	20AI003.2	L2
10 (a)	List the cloud deployment models and give a detailed about them	7M	20AI003.3	L2
10 (b)	Discuss the operational and economic benefits of SaaS	5M	20AI003.3	L2
<b>OR</b>				
11 (a)	Explain in detail about cloud delivery model	7M	20AI003.3	L2
11 (b)	Write any 3 advantages and disadvantages of Cloud computing	5M	20AI003.3	L2
12 (a)	What is resource provisioning? Explain resource provisioning methods.	5M	20AI003.4	L2
12 (b)	Write short on Virtual machine security	7M	20AI003.4	L2
<b>OR</b>				
13 (a)	Write short note on cloud security challenges	6M	20AI003.4	L2
13 (b)	Explain inter cloud resource management	6M	20AI003.4	L2
14 (a)	Explain hadoop architecture.	6M	20AI003.5	L2
14 (b)	Explain in detail the architecture of Google App Engine	6M	20AI003.5	L2
<b>OR</b>				
15 (a)	Write short notes on i. Eucalyptus ii. Open Nebula iii. Open Stack	6M	20AI003.5	L2
15 (b)	Describe in detail about Amazon Web Service	6M	20AI003.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	CSE /CSE (AI & ML)			<b>Academic Year</b>	2022 – 2023
<b>Course Code</b>	20AI502	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Artificial Intelligence</b>						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What do you mean by AI technique?	20AI502.2	L1
2	Define Artificial Intelligence	20AI502.1	L1
3	What is predicate logic?	20AI502.3	L1
4	Define Expert System	20AI502.5	L1
5	What is Resolution Refutation?	20AI502.4	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Discuss the characteristics of AI problem. Can towers of Hanoi problem be considered as AI problem? Justify your answer with suitable discussions	6M	20AI502.1	L1
6 (b)	List and explain the applications of Artificial Intelligence	6M	20AI502.1	L2
<b>OR</b>				
7 (a)	What do you mean by AI technique? How will you know that your AI system readily works?	6M	20AI502.1	L2
7 (b)	Explain the four categories of AI	6M	20AI502.1	L2
8 (a)	Explain heuristic search technique with example	6M	20AI502.2	L2
8 (b)	Differentiate between A* algorithm and best first search algorithm	6M	20AI502.2	L2
<b>OR</b>				
9 (a)	Explain the production system with components and characteristics. List the requirement of good control strategies.	6M	20AI502.2	L2
9 (b)	Solve water jug problem using production rule system	6M	20AI502.2	L2
10 (a)	What is predicate logic? Explain the predicate logic representation with reference to suitable example	6M	20AI502.3	L2
10 (b)	Write the propositional resolution refutation with an example	6M	20AI502.3	L2
<b>OR</b>				
11 (a)	Explain the varieties of Logic	6M	20AI502.3	L2
11 (b)	Give a brief note on Axiomatic system	6M	20AI502.3	L2
12 (a)	What are frames? Give a sample frame of computer department of college	6M	20AI502.4	L1
12 (b)	Explain the knowledge representation using semantic networks	6M	20AI502.4	L2
<b>OR</b>				
13 (a)	Explain CYC	6M	20AI502.4	L2
13 (b)	Explain Conceptual dependency along with its goals and representation	6M	20AI502.4	L2
14 (a)	Define Expert system. Explain in brief about applications of expert system	6M	20AI502.5	L2
14 (b)	Draw and explain the components of Expert system architecture	6M	20AI502.5	L2
<b>OR</b>				
15 (a)	Explain about Truth Maintain System	6M	20AI502.5	L2
15 (b)	Explain the phases of expert system with neat architecture	6M	20AI502.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	CSE			<b>Academic Year</b>	2022 – 2023
<b>Course Code</b>	20CS001	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Object Oriented Analysis and Design</b>						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Recall Decomposition and Abstraction	20CS001.2	L2
2	What is Domain Analysis?	20CS001.1	L1
3	List any four UML Diagrams	20CS001.3	L1
4	State chart diagram	20CS001.5	L1
5	Define Processes and Threads	20CS001.4	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What are the Attributes of Complex Systems? Explain	6M	20CS001.1	L2
6 (b)	Write the importance of Modularity and Concurrency	6M	20CS001.1	L1
<b>OR</b>				
7 (a)	List the major and minor elements of object Model and explain major elements	6M	20CS001.1	L2
7 (b)	Explain Designing complex System	6M	20CS001.1	L2
8 (a)	Explain how do you identify Classes and Objects	6M	20CS001.2	L2
8 (b)	Discuss how the quality of Abstractions is measured	6M	20CS001.2	L2
<b>OR</b>				
9 (a)	Write four kinds of relationships in UML	6M	20CS001.2	L2
9 (b)	Discuss Key Abstractions and Mechanisms	6M	20CS001.2	L2
10 (a)	Explain the importance of Architecture and what are the Building blocks of Architecture	6M	20CS001.3	L2
10 (b)	What is the importance of modeling and why you need Model?	6M	20CS001.3	L1
<b>OR</b>				
11 (a)	Write about conceptual model of UML	6M	20CS001.3	L2
11 (b)	Draw the Class Diagram and Object diagram for library management System	6M	20CS001.3	L2
12 (a)	How do you use Interaction diagram when you model dynamic aspects of system. Explain with an example	6M	20CS001.4	L2
12 (b)	Write the features that distinguish collaboration diagram and sequence diagrams	6M	20CS001.4	L2
<b>OR</b>				
13 (a)	What is use Case? Draw the use chase diagram for Online Railway Reservation system	6M	20CS001.4	L2
13 (b)	What is collaboration diagram and sequence diagram. Draw Collaboration and sequence diagram for simple telephone call	6M	20CS001.4	L2
14 (a)	What is component and component diagram? Draw component diagram for bank management system	6M	20CS001.5	L2
14(b)	What is Deployment and Deployment diagram? Draw Deployment diagram for bank management system	6M	20CS001.5	L2
<b>OR</b>				
15 (a)	Draw the deployment diagram for mobile network management system	6M	20CS001.5	L1
15 (b)	Draw the Component and Deployment Diagram for Online Shopping management system	6M	20CS001.5	L2

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<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	CSE			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20CS501	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	I
<b>Course</b>	Java Programming						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Variable and rules for declare variable	20CS501.1	L1
2	What is a class and Object?	20CS501.2	L1
3	Define Package ,Interface	20CS501.3	L1
4	What is an Applet?	20CS501.4	L1
5	Write the concept of Event handler	20CS501.5	L2

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain conditional operator and Bitwise operator with an example	6M	20CS501.1	L2
6 (b)	Differentiate between Implicit and Explicit type casting	6M	20CS501.1	L2
<b>OR</b>				
7 (a)	Explain data types in java	6M	20CS501.1	L2
7 (b)	Explain Array declaration, Initialization, and accessing an elements in an Array.	6M	20CS501.1	L2
8 (a)	What is a Constructor and explain types of constructor with an example	8M	20CS501.2	L2
8 (b)	Explain static keyword and final keyword	4M	20CS501.2	L2
<b>OR</b>				
9 (a)	What is inheritance and explain Multilevel inheritance with an example	6M	20CS501.2	L2
9 (b)	Explain method overloading with an example	6M	20CS501.2	L2
10 (a)	Explain Exception Handling with an example	7M	20CS501.3	L2
10 (b)	Explain Multithreading with an example	5M	20CS501.3	L2
<b>OR</b>				
11 (a)	Explain the thread life cycle with neat diagram	7M	20CS501.3	L2
11 (b)	Differentiate between interface Vs Abstract classes	5M	20CS501.3	L2
12 (a)	Explain File Handling using streams	5M	20CS501.4	L2
12 (b)	Explain Applet life cycle with neat diagram	7M	20CS501.4	L2
<b>OR</b>				
13 (a)	Explain reading and writing in files with an example	6M	20CS501.4	L2
13 (b)	Explain sting classes and methods with an example	6M	20CS501.4	L2
14 (a)	Explain Event handling with an example?	6M	20CS501.5	L2
14 (b)	Difference between Adapter classes and Inner classes.	6M	20CS501.5	L2
<b>OR</b>				
15 (a)	Write a brief notes on Components and Containers	4M	20CS501.5	L2
15 (b)	Explain Border Layout and Grid Layout with an example	8M	20CS501.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Common to All			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20CSO01	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Data Structures and Algorithms (Open Elective)</b>						

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>							
No.	Questions (1 through 5)					Learning Outcome (s)	DoK
1	What are the different applications of Stacks?					20CSO01.2	L1
2	What is Abstract Data Type (ADT)?					20CSO01.2	L2
3	What is greedy technique?					20CSO02.5	L2
4	What are time and space complexities?					20CSO02.1	L1
5	Define data structure					20CSO02.1	L1
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>							
No.	Questions (6 through 15)		Marks			Learning Outcome (s)	DoK
6 (a)	What is a stack? Explain about various operations of a stack with algorithms		8M			20CSO01.2	L2
6 (b)	What are the different types of arrays? Explain		4M			20CSO01.2	L2
<b>OR</b>							
7 (a)	Define Sparse matrix. Write about various types of sparse matrices with examples		6M			20CSO01.2	L2
7 (b)	Explain about Asymptotic notations of Time efficiency		6M			20CSO01.2	L2
8 (a)	Define a Queue. Explain about various operations of a Queue with algorithms		8M			20CSO01.2	L2
8 (b)	Explain the differences between array and a stack		4M			20CSO01.2	L2
<b>OR</b>							
9 (a)	Briefly Explain about Singly linked list operations and write its algorithms		10M			20CSO01.2	L2
9 (b)	Explain applications of singly linked list		2M			20CSO01.2	L2
10 (a)	Discuss the linear search technique with example		6M			20CSO01.3	L2
10 (b)	Discuss the bubble sort technique with example		6M			20CSO01.3	L2
<b>OR</b>							
11 (a)	Explain Quick sort technique with example		10M			20CSO01.3	L2
11 (b)	What is divide and conquer approach?		2M			20CSO01.3	L1
12 (a)	Explain Binary search tree insertion, deletion and traversal operations with examples		8M			20CSO01.4	L2
12 (b)	What are graph representation methods and explain		4M			20CSO01.4	L2
<b>OR</b>							
13 (a)	Explain graph traversal techniques		6M			20CSO01.4	L2
13 (b)	Explain about minimal spanning tree of a graph		6M			20CSO01.4	L2
14 (a)	Explain prims algorithm		6M			20CSO01.5	L2
14 (b)	Explain Kruskal 's algorithm		6M			20CSO01.5	L2
<b>OR</b>							
15 (a)	Explain All pair shortest path algorithm		6M			20CS502.5	L2
15 (b)	Explain 0/1 knapsack problem		6M			20CS502.5	L2

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<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	CSE			<b>Academic Year</b>	2022 – 2023
<b>Course Code</b>	20CS502	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Computer Networks</b>						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What are the different applications of WAN and MAN?	20CS502.1	L1
2	What is a bus topology?	20CS502.2	L1
3	What is Wi-Fi?	20CS502.3	L1
4	What is congestion?	20CS502.4	L1
5	What is IP address?	20CS502.5	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain different Network Topologies	6M	20CS502.1	L2
6 (b)	What are the different Switching Techniques? Explain	6M	20CS502.1	L2
<b>OR</b>				
7 (a)	Explain the functions of various layers in ISO-OSI reference model	6M	20CS502.1	L2
7 (b)	Discuss in detail about Data link Layer services	6M	20CS502.1	L2
8 (a)	Explain Error control & Flow Control Mechanisms in detail	6M	20CS502.2	L2
8 (b)	Explain about Cyclic Redundancy Check with an example	6M	20CS502.2	L2
<b>OR</b>				
9 (a)	Explain about UDP	6M	20CS502.2	L2
9 (b)	Explain the 802.11 Architecture & Protocol Stack	6M	20CS502.2	L2
10 (a)	Explain about Email Architecture	7M	20CS502.3	L2
10 (b)	Discuss in detail about FTP & HTTP	5M	20CS502.3	L2
<b>OR</b>				
11 (a)	Explain how congestion controlled in network layer by using any one protocol	7M	20CS502.3	L2
11 (b)	What are the services offered by TCP?	5M	20CS502.3	L1
12 (a)	Explain IPv4 datagram format.	6M	20CS502.4	L2
12 (b)	Explain Elements of Transport protocols	6M	20CS502.4	L2
<b>OR</b>				
13 (a)	Explain ARP	6M	20CS502.4	L2
13 (b)	Explain IP V6 header format	6M	20CS502.4	L2
14 (a)	Explain TCP Connection Management Modeling	7M	20CS502.5	L2
14 (b)	Explain TCP Timer Management	5M	20CS502.5	L2
<b>OR</b>				
15 (a)	Explain about DNS	7M	20CS502.5	L2
15 (b)	Explain Email Architecture	5M	20CS502.5	L2

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<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Common to All			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20CEO01	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	Urban Environmental Services (Open Elective)						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define urban health and urban planning	20CEO01.1	L1
2	Define urban form	20CEO01.2	L1
3	List any four advantages of urban transport planning	20CEO01.3	L1
4	Recall the concept of access and mortality	20CEO01.4	L2
5	What is meant by conceptual framework?	20CEO01.5	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	List and explain the elements of urban form	12 M	20CEO01.1	L2
<b>OR</b>				
7	Explain the factors affecting the urban environment and health	12M	20CEO01.1	L2
8 (a)	Define urban sprawl index and discuss the advantages and disadvantages of urban sprawl	6M	20CEO01.2	L2
8 (b)	List out the physical activities and explain the importance of physical activity	6M	20CEO01.2	L2
<b>OR</b>				
9	Define urban renewal and explain the assessment of health effects using measured urban form	12M	20CEO01.2	L2
10 (a)	Discuss briefly the problems related to transport planning	6M	20CEO01.3	L2
10 (b)	Explain the goals and objectives of transport planning	6M	20CEO01.3	L2
<b>OR</b>				
11	Define transport planning and explain the process of transport planning	12M	20CEO01.3	L2
<b>OR</b>				
12	Define spatial accessibility and explain the dimensions to access the health care	12M	20CEO01.4	L2
<b>OR</b>				
13	Explain briefly the spatial access and travel behavior	12M	20CEO01.4	L2
14 (a)	Define urban environment and explain briefly the opportunities and challenges of present scenario of urban development	6M	20CEO01.5	L2
14(b)	What is investigation data collection in urban planning and explain in brief the importance of data collection	6M	20CEO01.5	L2
<b>OR</b>				
15	Discuss briefly the priorities for future research of urban environment and health services	12M	20CEO01.5	L2

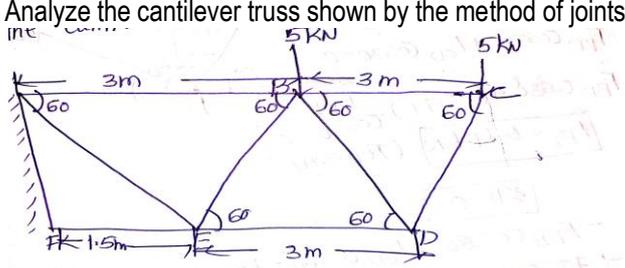
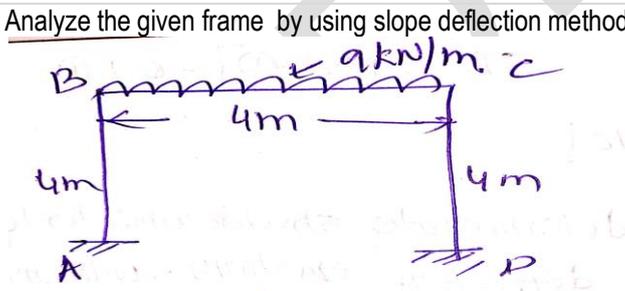
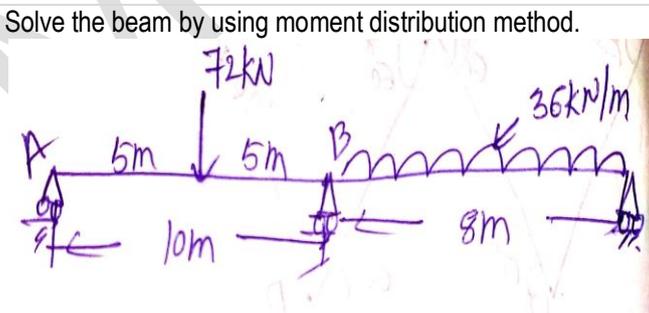
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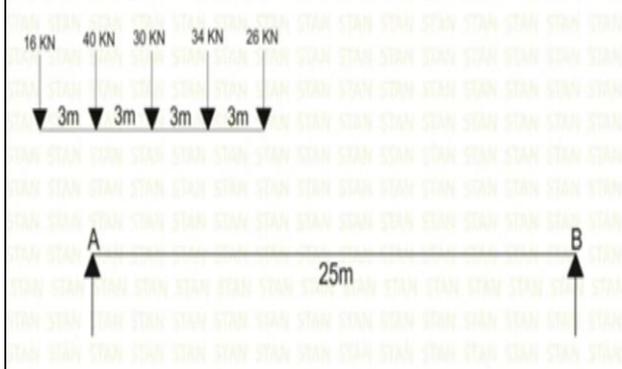
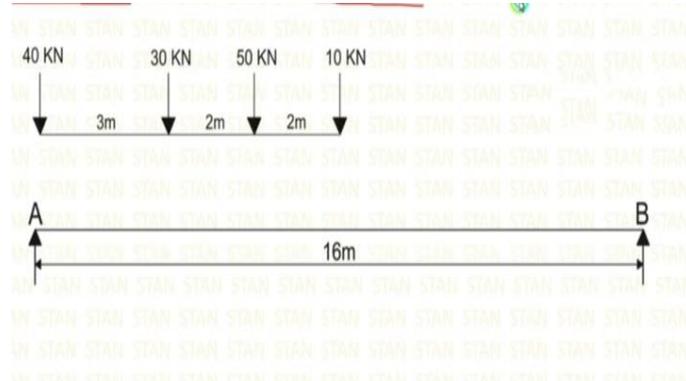
Degree	B. Tech. (U. G.)	Program	Civil Engineering			Academic Year	2022 - 2023
Course Code	20CE005	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Structural Analysis						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define statically determinate structure and write examples also	20CE501.1	L1
2	List any four methods of analysis trusses	20CE501.2	L1
3	Define the carryover moment and factor	20CE501.3	L1
4	Define three hinged arch	20CE501.4	L1
5	What is the concept of influence line?	20CE501.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Analyze the cantilever truss shown by the method of joints 	12M	20CE501.1	L3
OR				
7	Define and derive the Castiglione's theorems	12M	20CE501.1	L3
8	Explain the procedure for analyzing the continuous beams or frames by using slope deflection method	12M	20CE501.2	L3
OR				
9	Analyze the given frame by using slope deflection method 	12M	20CE501.2	L3
10	Solve the beam by using moment distribution method. 	12M	20CE501.3	L3
OR				
11	Explain the procedure for analyzing the continuous beams or frames by using moment distribution method	12M	20CE501.3	L3
12.(a)	A three hinged parabolic arch of span 40m and a rise 8m	6M	20CE501.3	L3

	carries a concentrated loads of 200KN and 150KN at a distance of 8m and 16m from the left end and udl of 50KN/M on the right half of the span find the horizontal thrust			
12(b)	Explain the concept of eddy's theorem and explain the terms normal thrust and radial shear	6M	20CE501.3	L2
<b>OR</b>				
13 (a)	Derive the two hinged arch by strain energy method and to find the horizontal; thrust.	6M	20CE501.4	L3
13 (b)	A parabolic arch hinged at both ends has a span of 60m and a rise of 12m a concentrated load of 80KN acts at a distance of 15m from left hinge. The second moment of area varies as the secant of the inclination of the arch axis. Calculate the horizontal thrust and reactions at the hinge. Also calculate the net BM at the section.	6M	20CE501.4	L3
14.	<p>A train of 5 wheel loads crosses a simply supported girder of 25 m span. Using influence lines, calculate the maximum positive and negative shear forces and maximum bending moment at mid span. Also calculate the absolute maximum bending moment as shown in the fig.</p> 	12M	20CE501.5	L3
<b>OR</b>				
15	<p>A train of 4 concentrated loads moves from left to right on simply supported girder of 16m. Make ILD for absolute maximum negative shear force and absolute maximum bending moment. And also calculate the values as shown in fig.</p> 	12M	20CE501.5	L3

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Civil Engineering			<b>Academic Year</b>	2022 – 2023
<b>Course Code</b>	20CE503	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	Foundation Engineering						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define soil exploration	20CE503.1	L1
2	Define slope and its necessity	20CE503.2	L1
3	Define shallow foundation and its types	20CE503.3	L1
4	Define earth retaining structure	20CE503.4	L1
5	Define end bearing pile	20CE503.5	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Explain the field test standard penetration test by using split spoon samplers and types of correction	12 M	20CE503.1	L2
<b>OR</b>				
7 (a)	Explain about auger boring with neat sketch	6M	20CE503.1	L2
7 (b)	Explain soil investigation report	6M	20CE503.1	L2

8 (a)	The shearing strength parameters of a soil are $c' = 26.1 \text{ kN/m}^2$ $\phi' = 15^\circ$ $c'_m = 17.8 \text{ kN/m}^2$ $\phi'_m = 12^\circ$ Calculate the factor of safety (a) with respect to strength, (b) with respect to cohesion and (c) with respect to friction. The average intergranular pressure $t_f$ on the failure surface is $102.5 \text{ kN/m}^2$	6M	20CE503.2	L3
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8 (b)	What are types of slope failures and explain briefly	6M	20CE503.2	L1
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**OR**

9 (a)	Explain briefly about Taylor's stability number method in finite slopes	6M	20CE503.2	L2
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9 (b)	What will be the factors of safety with respect to average shearing strength, cohesion and internal friction of a soil, for which the shear strength parameters obtained from the laboratory tests are $c' = 32 \text{ kN/m}^2$ and $\phi' = 18^\circ$ ; the expected parameters of mobilized shearing resistance are $c'_m = 21 \text{ kN/m}^2$ and $\phi'_m = 13^\circ$ and the average effective pressure on the failure plane is $110 \text{ kN/m}^2$ . For the same value of mobilized shearing resistance determine the following: a. Factor of safety with respect to friction when that with respect to cohesion is unity b. Factor of safety with respect to strength	6M	20CE503.2	L3
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10 (a)	What are factors affecting the footings or foundations?	6M	20CE503.3	L2
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10 (b)	Explain the method to determine the allowable load capacity of pile by using plate load test	6M	20CE503.3	L2
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**OR**

11	Explain briefly about raft foundation, and spread footing with neat sketch	12M	20CE503.3	L2
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12	Explain the components of well foundation	12M	20CE503.4	L2
<b>OR</b>				
13 (a)	Explain the static analysis for load bearing capacity of piles in soil	6M	20CE503.4	L2
13 (b)	Explain briefly about codal recommendations for well foundation	6M	20CE503.4	L2
14 (a)	What are different types of lateral earth pressure and functions?	6M	20CE503.5	L1
14(b)	Explain about Rankine active earth pressure theory	6M	20CE503.5	L2
<b>OR</b>				
15	Explain briefly about coulombs active earth pressure and coefficient for inclined back fill	12M	20CE503.5	L2

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Civil Engineering			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20CE502	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Design of Reinforced Concrete Elements</b>						

**Note: IS: 456 – 2000 and SP- 16 Charts are allowed into the examination hall  
Assume the missing data**

<b>Part A (Short Answer Questions 5 x 2 = 10 Marks)</b>				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	Differentiate working stress method and limit state design.		20CE502.1	L2
2	Differentiate one way slab and two way slab.		20CE502.2	L2
3	Define Slenderness ratio.		20CE502.3	L1
4	When is combined footing provided?		20CE502.4	L2
5	Recall the active earth pressure and passive earth pressure.		20CE502.5	L1
<b>Part B (Long Answer Questions 5 x 12 = 60 Marks)</b>				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Determine the minimum effective depth required and the corresponding area of tension reinforcement for a rectangular beam having a width of 200 mm to resist an ultimate moment of 200 kN.m. Using M-20 grade concrete and Fe-415 HYSD bars.	12 M	20CE502.1	L2
<b>OR</b>				
7a	Write the basic assumptions & advantages in Limit State Design.	6M	20CE502.1	L2
7b	Neatly sketch and define the stress block parameters of reinforced concrete element. Also mention the limiting values of neutral axis ( $X_u$ ) of rectangular R/C section if Fe415 and Fe500 grade steel used.	6M	20CE502.1	L2
<b>OR</b>				
8	Design a two-way slab for a residential roof to suit the following data: Size of roof = 4.5 m by 6 m, Edge conditions; simply supported on all the sides on load bearing masonry walls 300 mm thick without any provision for torsion at corners. Materials: M-20 grade concrete and Fe-415 HYSD bars.	12M	20CE502.2	L3
<b>OR</b>				
9	Design the waist slab type staircase consisting of a straight flight of stairs resting on two stringer beams along the two sides. Assume the span of the slab as 2 m with risers of 160 mm and treads of 270 mm. live load= 3 kN/m <sup>2</sup> . Adopt M-20 grade concrete and Fe250 grade steel.	12M	20CE502.2	L3
<b>OR</b>				
10	Design a square column 400mm X 400mm, 3.3m long subjected to a working load of 1000kN. Use M20 grade of concrete, Fe 415 steel. The column is effectively held in position and direction at both the ends.	12M	20CE502.3	L2
<b>OR</b>				
11	Design the reinforcement of R.C square column	12M	20CE502.3	L3

	300x300mm size fixed at both ends over a clear height of 6m .The column carrying axial load 30kN and moment 2kN-m .Apply relevant design checks and neatly detail the reinforcement. Use concrete grade M25 and HYSD steel Fe500.			
12	Design an isolated square footing to carry column load 600 kN and moment 30 kN-m respectively. Assume safe bearing capacity of soil 120 kN/m <sup>2</sup> and use concrete grade M25 and Steel reinforcement Fe415. Apply relevant design checks for strength and serviceability conditions. (Use Limit State Method).	12M	20CE502.4	L3
<b>OR</b>				
13	Explain in detail the principles involved in the design of raft foundation.	12M	20CE502.4	L3
14	Explain the design steps involved in the principle of Cantilever retaining wall .	12M	20CE502.5	L3
<b>OR</b>				
15	Design a circular water tank with flexible connection at base for a capacity of 40k liters. The tank rests on a firm level ground. The height of tank including a free board of 200 mm should not exceed 3.5m. The tank is open at top. Use M 20 concrete and Fe 415 steel. Draw to a suitable scale: i) Plan at base ii) Cross section through centre of tank.	12M	20CE502.5	L3

## Semester End Examination, Nov./Dec., 2022

<b>Degree</b>	B. Tech. (U. G.)	<b>Program</b>	Civil Engineering			<b>Academic Year</b>	2022 - 2023
<b>Course Code</b>	20CE005	<b>Test Duration</b>	3 Hrs.	Max. Marks	70	<b>Semester</b>	V
<b>Course</b>	<b>Construction Equipment Automation</b>						

**Part A (Short Answer Questions 5 x 2 = 10 Marks)**

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any four common types of construction equipment	20CE005.1	L1
2	What is the importance of selection of equipment?	20CE005.2	L1
3	List any four types of crushers	20CE005.3	L1
4	List any 3 applications of Automation in Highways	20CE005.4	L1
5	What are the benefits of robots in construction industry?	20CE005.5	L1

**Part B (Long Answer Questions 5 x 12 = 60 Marks)**

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Illustrate the factors effecting of selection of construction equipment briefly	12 M	20CE005.1	L2
<b>OR</b>				
7 (a)	Describe the relationship between scheduling and estimating	6M	20CE005.1	L1
7 (b)	Illustrate the importance of job layout preparation for construction project	6M	20CE005.1	L2
8 (a)	Illustrate the difference between Men and Machinery in construction industry	6M	20CE005.2	L2
8 (b)	What are the advantages of Construction mechanization?	6M	20CE005.2	L1
<b>OR</b>				
9 (a)	Illustrate the factors effecting of purchasing of the equipment in construction industry	6M	20CE005.2	L2
9 (b)	Illustrate the importance for planning of construction equipment	6M	20CE005.2	L2
10 (a)	Illustrate the applications of grouting equipment and its advantages	6M	20CE005.3	L2
10 (b)	Discuss about concrete mixing and compaction equipment	6M	20CE005.3	L1
<b>OR</b>				
11	Illustrate the specifications for ordering of the equipment in construction industry	12M	20CE005.3	L2
12	Illustrate the types of crushers and their applications briefly	12M	20CE005.4	L2
<b>OR</b>				
13 (a)	Illustrate the applications and advantages of Automation in Canal lining	6M	20CE005.4	L2
13 (b)	Discuss about Structural Health monitoring using Automation	6M	20CE005.4	L2
14 (a)	What are the major advantages of automation in timber construction?	6M	20CE005.5	L1
14(b)	What are the major advantages of automation in structural steel cutting?	6M	20CE005.5	L1
<b>OR</b>				

15	Illustrate the Automation applications in prefabrication of masonry and on-site masonry construction	12M	20CE005.5	L2
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