NSRIT

AUTONOMOUS

SEMESTER END EXAMINATION MODEL QUESTION PAPERS

Semester IV
B. Tech.

ACADEMIC REGULATION 2020

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Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	Common To All		Academic Year	2021 - 2022
Course Code	20HSX03	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	Managerial Economics and Financial Analysis					

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is law of demand?	20HSX03.1	L1
2	Define Angle of incidence.	20HSX03.2	L1
3	What is double entry book keeping?	20HSX03.3	L1
4	What is Pay Back Period?	20HSX03.4	L1
5	What is Ratio Analysis?	20HSX03.5	L1

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Define managerial economics and explain the features of managerial economics.	6M	20HSX03.1	L2
6 (b)	What the techniques employed to forecast demand for new products?	6M	20HSX03.1	L1
OR				
7 (a)	How do you explain the relation of managerial economics with other subjects? Explain	6M	20HSX03.1	L2
7 (b)	What do you mean by demand forecasting? Explain various demand forecasting techniques.	6M	20HSX03.1	L2
8(a)	Explain the production function with reference to Law of variable proportions and substitutability of factors.	6M	20HSX03.2	L2
8 (b)	What is break even analysis? How do you determine breakeven point? Illustrate.	6M	20HSX03.2	L2
OR				
9 (a)	Write about Cobb Douglas Production function.	6M	20HSX03.2	L2
9 (b)	Calculate margin of safety and the number of actual sales from the following: i) Profit Rs. 10,000 ii) ii) PV Ratio 50% iii) 12340iii) BEP sales Rs. 20,000.	6M	20HSX03.2	L3
10 (a)	From the following details, prepare final accounts of Vikrant Company for the year ended 31st March, 2016 : Particulars Rs. Capital 2,00,000 Furniture 30,000 Cash in hand 2,400 Sales 4,00,400 Purchases 2,40,000 Bills receivable 40,000 Bills payable 44,000 Rent & taxes 20,000 Stock (1.4.2015) 70,000 Wages 32,000 Debtors 1,00,000 Reserve for bad debts 2,000 Creditors 48,000 Salaries 40,000 Plant & Machinery 1,20,000 Additional Information:	6M	20HSX03.3	L3

	i) Stock on 31.3.2016 Rs. 80,000 ii) Outstanding rent Rs. 4,000, iii) Wages Rs. 6,000, iv) Salaries Rs. 8,000 v) Provide depreciation on Plant & Machinery at 10% on furniture at 20% Increase reserve for bad debts on debtors to 5%.			
10 (b)	Write about trading and profit and loss account statements.	6M	20HSX03.3	L2
OR				
11 (a)	What do you mean by final accounts? What are its constituents? Name them and briefly explain the purpose of each of them.	6M	20HSX03.3	L2
11 (b)	Journalise the following transactions in the books of Madhu and prepare necessary ledger accounts. 2020 January 1 : Madhu Commenced business with Rs.15,000 2020 January 2 :Purchased goods from Mukesh for Rs.2,000 2020 January 3 : Paid rent Rs.5,000 2020 January 4 : Purchased furniture for Rs.10,000 2020 January 5 : Sold goods for Rs.7,000 2020 January 6 : Paid salaries Rs.20,000 2020 January 7 : Paid insurance Rs.2,000 2020 January 8 : Mukesh pays Rs.1800 on full settlement of an account	6M	20HSX03.3	L3
12 (a)	How do you assess the proposal under capital budgeting?	6M	20HSX03.4	L2
12 (b)	Elucidate the demerits of different techniques of capital budgeting.	6M	20HSX03.4	L2
OR				
13 (a)	Write about techniques of capital budgeting.	6M	20HSX03.4	L2
13 (b)	What is meant by discounting and time value of money? How is it useful in capital budgeting?	6M	20HSX03.4	L2
14 (a)	Calculate debtor's turnover ratio, if total sales is Rs. 2,50,000, cash sales Rs. 70,000, debtors in the beginning is Rs. 16,000 and at the end Rs. 8,000 more.	6M	20HSX03.5	L3
14 (b)	What is ratio analysis? Discuss the different types of balance sheet ratios.	6M	20HSX03.5	L2
OR				
15 (a)	State the managerial uses of funds flow statement	6M	20HSX03.5	L1
15 (b)	What do you understand by working capital cycle and what is its importance?	6M	20HSX03.5	L2

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Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	Civil Engineering		Academic Year	2021 - 2022
Course Code	20CE402	Test Duration	3 Hrs.	Max. Marks 70	Semester	IV
Course	Hydraulics & Hydraulic Machinery					

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	State Chezy's Law.	20CE405.1	L1
2	What are Dimensionless numbers?	20CE405.2	L1
3	What is a Velocity Triangle?	20CE405.3	L1
4	What is a Draft Tube?	20CE405.4	L1
5	What is Cavitation?	20CE405.5	L1

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What are the 4 types of Channel Flow? Explain.	6M	20CE405.1	L2
6 (b)	Write about most Economical Section for a Trapezoidal Section Channel.	6M	20CE405.1	L2
	OR			
7 (a)	Write about Sub-critical Flow, Critical Flow & Super-critical Flow.	6M	20CE405.1	L2
7 (b)	Write about Computation of Flow.	6M	20CE405.1	L2
8 (a)	Write about Rayleigh's method of Dimensional analysis using a suitable example.	6M	20CE405.2	L2
8 (b)	Write about Buckingham's Pi Theorem using a suitable example.	6M	20CE405.2	L2
	OR			
9 (a)	Write about Geometric, Kinematic and Dynamic Similarities.	6M	20CE405.2	L2
9 (b)	Differentiate between Model & Prototype.	6M	20CE405.2	L2
10 (a)	Derive the expression for the Hydrodynamic Force of jet on a Stationary Vertical Flat Plate.	7M	20CE405.3	L2
10 (b)	Derive the expression for the Hydrodynamic Force of jet on a Stationary Inclined Flat Plate.	5M	20CE405.3	L2
	OR			
11 (a)	Describe about Velocity Triangles at Inlet and Outlet for the case of Force exerted by a Jet of Water on an Unsymmetrical Moving curved plate when the jet strikes tangentially at one of the tips.	6M	20CE405.3	L2
11 (b)	Derive the expression for Work done and Efficiency for 11(a) case.	6M	20CE405.3	L2
12 (a)	Describe about the typical layout of a Hydropower installation.	5M	20CE405.4	L2
12 (b)	Write about governing mechanism for turbines.	7M	20CE405.4	L2
	OR			
13 (a)	Differentiate between Impulse Turbines and Reaction Turbines.	6M	20CE405.4	L2
13 (b)	Write about any one the following: (i) Pelton Wheel (ii) Francis Turbine (iii) Reaction Turbine	6M	20CE405.4	L2
14 (a)	Describe about Centrifugal Pumps.	7M	20CE405.5	L2
14 (b)	Write about Pumps in parallel and Series.	5M	20CE405.5	L2
	OR			
15 (a)	What are Reciprocating Pumps?	6M	20CE405.5	L1
15 (b)	What are Characteristic Curves w.r.t performances of Pumps?	6M	20CE405.5	L1

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	Civil Engineering		Academic Year	2021 - 2022
Course Code	20CE403	Test Duration	3 Hrs.	Max. Marks 70	Semester	IV
Course	Concrete Technology					

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define hydration of cement	20CE403.1	L1
2	Define workability of concrete	20CE403.2	L1
3	What are the major compounds in Portland cement?	20CE403.3	L1
4	What are the advantages of Fiber Reinforced Concrete?	20CE403.4	L1
5	What is mean by characteristic strength of the concrete?	20CE403.5	L1

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Write short notes on wet process & dry process of cement manufacturing	12 M	20CE403.1	L2
OR				
7 (a)	Describe the setting time and soundness test of cement	6M	20CE403.1	L2
7 (b)	Illustrate the briefly note on classification of aggregates?	6M	20CE403.1	L2
8	What are the properties of fresh concrete & What are the different tests of workability explain them any one	12M	20CE403.2	L2
OR				
9 (a)	Illustrate various factors influencing the Workability of Concrete	6M	20CE403.2	L2
9 (b)	Illustrate the concrete manufacturing process	6M	20CE403.2	L2
10 (a)	What is the importance of Non-Destructive tests?	6M	20CE403.3	L1
10 (b)	Explain in detail the factors influencing the strength results in case of hardened concrete	6M	20CE403.3	L2
OR				
11	Write a note on compressive strength of Concrete	12M	20CE403.3	L2
12	Write about (a) High Density concrete (b) Self compacting concrete (c) Cellular concrete.	12M	20CE403.4	L2
OR				
13 (a)	Write about (a) High performance concrete (b) Fiber reinforced concrete (c) SIFCON	6M	20CE403.4	L2
13 (b)	Explain salient features of Sulphur infiltrated concretes	6M	20CE403.4	L2
14 (a)	What are the factors influencing the Mix Design?	4M	20CE403.5	L1
14 (b)	Design a concrete mix for characteristic strength of 30MPa at 28 days with a standard deviation of 4MPa.The specific gravity of FA and CA are 2.65 and 2.75 respectively. A slump of 60mm is necessary. The specific gravity of cement is 3.15. Assuming the necessary data design the mix as per IS code method.	8M	20CE403.5	L3
OR				

| 15 | Design a concrete mix of M20 grade for a roof slab. Take a Standard deviation of 4MPa. The specific gravities of Coarse Aggregate and Fine Aggregate are 2.73 and 2.60 respectively. The bulk density of coarse aggregate is 1615kg/m3 and fineness modulus of fine aggregate is 2.74. A slump of 55mm is necessary. The water absorption of coarse aggregate is 1% and free moisture in fine aggregate is 2%. Design the concrete mix using IS code method. Assume any missing data suitably. | 12M | 20CE403.5 | L3 |

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	Civil Engineering		Academic Year	2021 - 2022
Course Code	20CE404	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	Soil Mechanics					

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define the terms void ratio, porosity and write the relation between them	20CE404.1	L1
2	Define critical hydraulic gradient.	20CE404.2	L1
3	Differentiate between primary consolidation and secondary consolidation.	20CE404.3	L2
4	List out any three merits of direct shear test.	20CE404.4	L1
5	Distinguish clearly between 'slope failure' and 'base failure' in the case of finite slopes.	20CE404.5	L2

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Describe in detail the Indian Standard Classification system. When would you use dual symbols for soils?	6M	20CE404.1	L2
6 (b)	The mass of wet soil when compacted in a mould was 19.55 kN. The water content of the soil was 16%. If the volume of the mould was 0.95 m^3. Determine (i) dry unit weight (ii) Void ratio (iii) degree of saturation and (iv) percentage air voids. Take G = 2.68.	6M	20CE404.1	L3
	OR			
7 (a)	What are the factors that affect compaction? Discuss.	6M	20CE404.1	L2
7 (b)	An earth embankment is compacted at a water content of 18% to a bulk density of 1.92 g/cm3. If the specific gravity of the sand is 2.7, find the void ratio and degree of saturation of the compacted embankment.	6M	20CE404.1	L3
8 (a)	Define flow net. What are the characteristics and uses of flow nets?	6M	20CE404.2	L2
8 (b)	A sand deposit consists of two layers. The top layer is 2.5 m thick (ρ = 1709.67 kg/m³) and the bottom layer is 3.5 m thick (ρ_{sat} = 2064.52 kg/m³). The water table is at a depth of 3.5 m from the surface and the zone of capillary saturation is 1 m above the water table. Draw the diagrams, showing the variation of total stress, neutral stress and effective stress.	6M	20CE404.2	L3
	OR			
9 (a)	Explain the factors affecting the permeability of the soils	6M	20CE404.2	L2
9 (b)	Calculate the coefficient of permeability of a soil sample in m/day, 6 cm in height and 50 cm^2 in cross-sectional area, if a quantity of water equal to 430 ml passed down in 10 minutes, under an effective constant head of 40 cm.	6M	20CE404.2	L3
10 (a)	Differentiate between 'compaction' and 'consolidation'.	5M	20CE404.3	L2
10 (b)	A concentrated point load of 200 kN acts at the ground surface. Find the intensity of vertical pressure at a depth of 10 m below the ground surface, and situated on the axis of the loading. What will be the vertical pressure at a point at a depth of 5 m and at a distance of 2 m from the axis of loading? Use Boussinesq's analysis	7M	20CE404.3	L3
	OR			
11 (a)	What are the assumptions of Terzaghi's one-dimensional consolidation theory?	6M	20CE404.3	L1
11 (b)	A saturated clay layer of 5m thickness takes 1.5 years for 50% consolidation, when drained on both sides. It's coefficient of volume change is 1.5x10^{-3} m2/kN. Evaluate the coefficient of permeability of the soil.	6M	20CE404.3	L3
12 (a)	What are the merits and demerits of direct shear test?	6M	20CE404.4	L1
12 (b)	A specimen of sand failed at a shear stress of 0.32 kg/cm2 under a	6M	20CE404.4	L3

	normal stress of 1 kg/cm2. Determine the shear parameters of sand. If the same sample is tested in triaxial apparatus under a cell pressure of 0.5 kg/cm2, determine the deviator stress at which specimen fails			
	OR			
13 (a)	Explain the Triaxial compression test to determine the shear strength of soil.	6M	20CE404.4	L2
13 (b)	A vane 10cm long and 8cm in diameter was pressed into soft clay at the bottom of a bore hole. Torque was applied and gradually increased to 450 kg-cm when failure took place. Subsequently, the vane was rotated rapidly so as to completely disturb the soil. The remoulded soil was sheared at a torque of 180 kg-cm. Determine the undrained shear strength of clay in both natural and remoulded states as well as the sensitivity of clay.	6M	20CE404.4	L2
14 (a)	What are the various methods of analysis of finite slopes? Explain any one of method	7M	20CE404.5	L2
14 (b)	A slope is to be constructed in a soil for which c = 0 and Φ = 36°. It is to be assumed that the water level may occasionally reach the surface of a slope with seepage taking place parallel to the slope. Determine the maximum slope angle for a factor of safety 1.5, assuming a potential failure surface parallel to the slope. What would be the factor of safety of the slope, constructed at this angle, if the water table should be below the surface? The saturated unit weight of the soil is 19 kN/m^3.	5M	20CE404.5	L2
	OR			
15 (a)	Explain in detail the friction circle method of stability analysis for slopes with sketch.	8M	20CE404.5	L2
15 (b)	A vertical cut is to be made in clayey soil for which tests gave c = 30 kN/m^2, γ = 16 kN/m^3 and Φ = 0. Find the maximum height for which the cut may be temporarily unsupported. For Φ = 0, and β =90°, the value of the stability number is 0.261.	4M	20CE404.5	L2

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	Civil Engineerig		Academic Year	2021 - 2022
Course Code	20CE405	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	CONSTRUCTION PROJECT MANAGEMENT					

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Project life cycle	20CE405.1	L1
2	What are the basic assumptions in creating a network diagram?	20CE405.2	L1
3	What is the purpose of cost benefit analysis?	20CE405.3	L1
4	What are earth work equipments?	20CE405.4	L1
5	What is meant by safety and risk management?	20CE405.5	L1

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Define project life cycle and explain the phrase in project management?	6M	20CE405.1	L2
6 (b)	Discuss the qualities of project manager	6M	20CE405.1	L2
	OR			
7 (a)	Discuss the planning and execution phrases in project management	6M	20CE405.1	L2
7 (b)	Explain the initiation and implementation phrases in project management	6M	20CE405.1	L2
8 (a)	List and explain the time estimates in CPM & PERT	6M	20CE405.2	L2
8 (b)	Discuss the assumptions and rules for network diagram?	6M	20CE405.2	L2
	OR			
9 (a)	Differentiate between CPM & PERT Networks	6M	20CE405.2	L2
9 (b)	 1. Draw network diagram 2. Calculate duration , variance and standard deviation 3. Critical path	6M	20CE405.2	L3
10 (a)	Define CBA and explain the procedure for CBA	7M	20CE405.3	L2
10 (b)	What is the purpose of CBA and its limitations?	5M	20CE405.3	L1
	OR			
11 (a)	Discuss about the software used for Construction project management	6M	20CE405.3	L2
11 (b)	Discuss the data analysis and project management information system	6M	20CE405.3	L2
12 (a)	Explain the economical considerations for construction equipments and handling	5M	20CE405.4	L2
12 (b)	Define earth work equipments and explain any two earth equipments	7M	20CE405.4	L2

	OR			
13 (a)	Discuss about clamshell buckets and graders	6M	20CE405.4	L2
13 (b)	Define truck production and what are the steps in calculating the truck production?	6M	20CE405.4	L2
14 (a)	What is risk management and explain the steps in risk management	7M	20CE405.5	L2
14 (b)	Discuss the causes of accidents on various sites	5M	20CE405.5	L2
	OR			
15 (a)	What is safety management and what are the measures and safety policies to be adopted?	6M	20CE405.5	L1
15 (b)	Determine the safety parameters for safety management	6M	20CE405.5	L2

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Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	CSE			Academic Year	2021 - 2022
Course Code	20CS403	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	Python Programming						

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is a variable? How it is created and assigned a data type?	20CS403.1	L1
2	Write a for loop that prints numbers from 0 to 100, using range function	20CS403.2	L2
3	Write the syntax of if-else statement in python	20CS403.3	L2
4	Define class & object	20CS403.4	L1
5	List out geometry manager classes in tkinter module	20CS403.5	L1

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Give short note on the following? i) Python comments ii) input() & print () function iii) python Indentation	6M	20CS403.1	L2
6 (b)	Write a Python program that reads four integers from user, prints them with a single print statement, without any space or newline between/after the values	6M	20CS403.1	L2
	OR			
7 (a)	Describe the following functions with example i. format() ii. eval() iii. type() iv. id() v. dir() vi.len()	6M	20CS403.1	L2
7 (b)	What are operators in Python? Describe specifically about identity operators & Membership operators	6M	20CS403.1	L2
8 (a)	Explain the syntax of while & for loops with example	6M	20CS403.2	L2
8 (b)	Write a python script to print the following pattern 2 4 6 8 10 12	6M	20CS403.2	L2
	OR			
9 (a)	Differentiate between lists and tuples in Python	6M	20CS403.2	L2
9 (b)	Write a short note on Python Dictionaries	6M	20CS403.2	L2
10	Explain any 6 functions of the following modules i. random ii. math	12M	20CS403.3	L2
	OR			
11 (a)	What is Module in Python? Explain, how can you use Modules in your program explain with an example code	6M	20CS403.3	L2
11 (b)	Write a short note on PIP. Explain installing packages via PIP	6M	20CS403.3	L2
12 (a)	What is File? Explain the file handling functions in python with example	6M	20CS403.4	L2
12 (b)	How to create a constructor in Python? Give an example	6M	20CS403.4	L2
	OR			
13 (a)	Demonstrate implementation of multiple inheritance in Python, with a program	6M	20CS403.4	L2
13 (b)	Explain the operator overloading in Python with example	6M	20CS403.4	L2
14	Explain tkinter module in Python GUI	12M	20CS403.5	L2
	OR			
15	Explain any 6 functions in NumPy with example	12M	20CS403.5	L2

Semester End Examination Model Paper

Degree	B.Tech.(U.G.)	Program	Mechanical Engineering		Academic Year	2021 – 2022
Course Code	20ME403	**Test Duration**	3 Hrs.	Max. Marks	70	**Semester**	IV
Course	**Kinematics of Machinery**					

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is meant by degrees of freedom of a mechanism?	20ME403.1	L1
2	State an application of Peaucellier mechanism.	20ME403.2	L1
3	Define instantaneous centre.	20ME403.3	L1
4	What are the different types of motion with which a follower can move?	20ME403.4	L2
5	What is law of gearing?	20ME403.5	L2

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Discuss various types of constrained motion.	6M	20ME403.1	L2
6 (b)	How is the Whitworth quick-return mechanism and crank slotted-lever mechanism different from each other? Explain.	6M	20ME403.1	L2
	OR			
7 (a)	Describe different inversions of double slider crank chain.	6M	20ME403.1	L2
7 (b)	Describe different inversions of quadric cycle chain.	6M	20ME403.1	L2
8 (a)	Explain with a neat sketch, Pantograph mechanism. State its applications.	6M	20ME403.2	L2
8 (b)	What is an automobile steering gear? What are its types? Which steering gear is preferred and why?	6M	20ME403.2	L1
	OR			
9 (a)	What is an automobile steering gear? Derive the condition for correct steering of an automobile?	6M	20ME403.2	L2
9 (b)	Draw a neat sketch of the Scott Russell's mechanism, and explain its working. How this mechanism can be modified to produce Grasshopper mechanism.	6M	20ME403.2	L2
10 (a)	Explain how by means of Klein's construction the acceleration of a reciprocating engine is determined.	6M	20ME403.3	L2
10 (b)	What is instantaneous centre of rotation? State Kennedy's theorem.	6M	20ME403.3	L1
	OR			
11 (a)	PQRS is a four bar chain with link PS fixed. The lengths of the links are PQ= 62.5 mm; QR = 175 mm; RS = 112.5 mm; and PS = 200 mm. The crank PQ rotates at 10 rad/s clockwise. Draw the when angle QPS = 60°and Q and R lie on the same side of PS. Find the angular velocity and angular acceleration of links QR and RS?	6M	20ME403.3	L3
11 (b)	What is the Coriolis acceleration component?	6M	20ME403.3	L2
12 (a)	Explain with sketches the different types of cams and followers.	6M	20ME403.4	L2
12 (b)	Discuss briefly the various types of belts used for the transmission of power.	6M	20ME403.4	L2

	OR			
13 (a)	What is a cam? What type of motion can be transmitted with a cam and follower combination? What are its elements?	6M	20ME403.4	L1
13 (b)	The following data is related to a symmetrical circular arc cam operating a flat faced follower. Least radius of the cam=27.5 mm, total lift= 12.5 mm, angle of lift=55^0, nose radius=3 mm speed of cam=600 rpm. Find i).Distance between cam centre and nose centres, ii). radius of circular flank, iii) angle of contact on the circular flank.	6M	20ME403.4	L3
14 (a)	Derive an expression for length of path of contact, length of arc contact and contact ratio for a pair of involute gears in contact.	6M	20ME403.5	L2
14 (b)	A pair of bevel gears is mounted on two intersecting shafts whose shaft angles are at 72^0 to each other. The velocity ratio of the gears is 2. Find the pitch angles.	6M	20ME403.5	L3
	OR			
15	A compound gear is shown in Fig. 2. An input torque of 100 N-m is given to the shaft B at 900 r.p.m. The sun and planet gears are all of the same diameter and pitch. Determine the speed and torque of the output shaft C, if the efficiency is 96%. Also determine the torque required to hold stationary the annulus wheel A1	12M	20ME403.5	L3
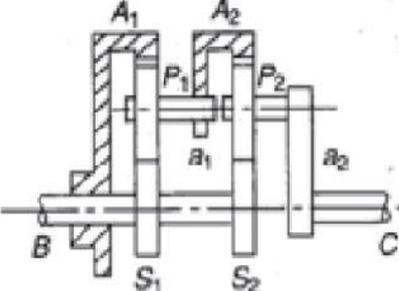
Semester End Examination Model Paper

Degree	B.Tech.(U.G.)	Program	Mechanical Engineering		Academic Year	2021 – 2022
Course Code	20ME404	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	Fluid Mechanics and Hydraulic Machines					

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Differentiate between dynamic viscosity and kinematic viscosity. What are their units of measurement?	20ME404.1	L2
2	Define path lines, stream lines and streak lines	20ME404.2	L1
3	What is dynamic similarity?	20ME404.3	L1
4	Write the expression for the force exerted by the jet on a stationery vertical plate.	20ME404.4	L2
5	Define Draft Tube.	20ME404.5	L1

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Prove that the pressure is same in all directions at a point in static fluid. Give some examples where this principle is applied.	6M	20ME404.1	L2
6 (b)	Explain U- tube differential manometer.	6M	20ME404.1	L2
OR				
7 (a)	Determine the gauge and absolute pressure at a point which is 4m below the free surface of water. Assume atmospheric pressure as 101.43 KN/m^2	6M	20ME404.1	L2
7 (b)	Explain the conditions for stability of a floating body and submerged body.	6M	20ME404.1	L2
8(a)	Explain how Reynold's experiment is conducted in the lab and bring its practical uses.	6M	20ME404.2	L2
8 (b)	The rate of flow of water through a horizontal pipe is 0.3 m^3/sec. The diameter of the pipe is suddenly enlarged from 25 cm to 50 cm. The pressure intensity in the smaller pipe is 1.4 kgf/cm^2. Determine loss of head due to sudden enlargement, pressure intensity in the large pipe and power lost due to enlargement.	6M	20ME404.2	L3
OR				
9 (a)	Derive an expression for finding the major loss when the fluid flows through a pipe	6M	20ME404.2	L3
9 (b)	Distinguish between: (i) Steady flow and un-steady flow, (ii) Uniform and non uniform flow, (iii) Compressible and incompressible flow, (iv) Rotational and irrotational flow (v) Laminar and turbulent flow.	6M	20ME404.2	L2
10 (a)	Distinguish among geometric, kinematic and dynamic similarities	6M	20ME404.3	L2
10 (b)	Define the following dimensionless numbers with their suitability: (i) Reynold's Number (ii) Weber Number.	6M	20ME404.3	L1
OR				
11 (a)	What do you mean by dimensionless number? What is its significance in the flow analysis?	6M	20ME404.3	L1
11 (b)	Discuss the need of dimensionless analysis	6M	20ME404.3	L2

12 (a)	Derive an expression for the force exerted by a jet of water on an inclined fixed plate in the direction of the jet.	6M	20ME404.4	L2
12 (b)	A jet of water of diameter 50mm moving with a velocity of 20 m/sec strikes a fixed plate in such a way that the angle between the jet and the plate is 60^0. Find the force exerted by the jet on the plate. i) In the direction normal to the plate. ii) In the direction of the jet.	6M	20ME404.4	L3
	OR			
13 (a)	Define a centrifugal pump. Explain the working of a single-stage centrifugal pump with sketches.	6M	20ME404.4	L1
13 (b)	A single acting reciprocating pump has a plunger of diameter 0.3m and stroke of length 0.4m. If the speed of the pump is 60 rpm and coefficient of discharge is 0.97, determine the percentage slip and actual discharge of the pump	6M	20ME404.4	L3
14 (a)	What do you mean by gross head, net head and efficiency of turbine? Explain the different types of efficiencies of a turbine.	6M	20ME404.5	L2
14 (b)	A Pelton wheel has a mean bucket speed of 35 m/s with a jet of water flowing at the rate of 1 m³/s under a head of 270 m. The buckets deflect the jet through an angle of 170°. Calculate the power delivered to the runner and the hydraulic efficiency of the turbine. Assume co-efficient of velocity as 0.98.	6M	20ME404.5	L3
	OR			
15 (a)	A Pelton wheel is to be designed for the following specifications. Power = 735.75 kW S.P, Head = 200 m, Speed = 800 r.p.m., η = 0.86 and jet diameter is not to exceed one-tenth the wheel diameter. Determine: (i) Wheel diameter, (ii) The number of jets required, and (iii) Diameter of the jet. Take Cv=0.98 and speed ratio =0.45.	6M	20ME404.5	L3
15 (b)	An inward flow reaction turbine with radial discharge with an overall efficiency of 85% is required to develop 180kw. The head is 10m; peripheral velocity is $0.96\sqrt{2gh}$; radial velocity of flow is $0.36\sqrt{2gh}$. The wheel is to make 180rpm. The hydraulic losses in the turbine are 25% of the available energy. Determine (i) the angle of the guide blade at inlet (ii) the wheel vane angle at inlet (iii) the diameter of the wheel (iv) the width of the wheel at inlet.	6M	20ME404.5	L3

Semester End Examination Model Paper

Degree	B.Tech.(U.G.)	Program	Mechanical Engineering		Academic Year	2021 – 2022
Course Code	20ME405	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	IC Engines and Gas Turbines					

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Mean Effective Pressure and Compression Ratio.	20ME405.1	L1
2	Draw Actual Valve Timing Diagram for four stroke SI and CI Engine.	20ME405.2	L1
3	What are Different Ignition systems being used for SI Engine?	20ME405.3	L1
4	What is the Chemical Composition of Liquefied Petroleum Gas?	20ME405.4	L1
5	What are the applications of pulse jet engines?	20ME405.5	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 Dual Cycle P-V and T-S Diagram, Find the Efficiency in terms of Compression Ratio.	6M	20ME405.1	L2
6 (b)	In an Air Standard Diesel Cycle, the Compression ratio is 16, at the beginning isentropic compression, the temperature is 15 ^{0}C and the pressure is 0.1 MPa. Heat is Added until the Temperature at the end of constant pressure process is 1480 ^{0}C .Calculate the following. (i) The cut-off ratio (ii) The heat supplied for Kg of air	6M	20ME405.1	L3
	OR			
7 (a)	Draw the Diesel Cycle P-V and T-S Diagram, Find the Efficiency in terms of Compression Ratio	6M	20ME405.1	L2
7 (b)	Explain (i) Time loss Factor (ii) Heat Loss Factor (iii) Volumetric Efficiency.	6M	20ME405.1	L2
8(a)	Describe the working principle of the Four stroke CI Engine. Mention the typical values of Valve timing diagram for Two stroke CI Engine	6M	20ME405.2	L2
8 (b)	Draw a labeled sketch showing the circuit diagram of Battery Ignition system and Discuss its working principles.	6M	20ME405.2	L2
	OR			
9 (a)	Explain the Combustion Stages of SI Engine.	6M	20ME405.2	L2
9 (b)	Explain knocking, properties and its effects in CI engine.	6M	20ME405.2	L2
10 (a)	What is Lubrication and explain Cooling System in IC Engine	6M	20ME405.3	L2
10 (b)	What is wilaan's line? How do you measure frictional power using this.	6M	20ME405.3	L2
	OR			
11 (a)	What is the significance of heat balance sheet? Discuss the procedure to draw heat balance sheet for CI engine?	6M	20ME405.3	L2
11 (b)	Discuss air flow movements in CI engines.	6M	20ME405.3	L2
12 (a)	Explain different categories of CI emissions. Also explain various factors effecting exhaust emission.	6M	20ME404.4	L2
12 (b)	What are the different gaseous fuels and their limitations?	6M	20ME404.4	L2
	OR			
13 (a)	What is the use of LPG, hydrogen and natural gas in SI Engine?	6M	20ME405.4	L2
13 (b)	What is Cetane number? What is the role of Cetane number in the performance of engine?	6M	20ME405.4	L2

14 (a)	What are the different rocket propulsion systems? Explain the working differences between the propeller-jet, turbojet and turbo-prop.	6M	20ME405.5	L2
14 (b)	A turbo-jet engine flying at a speed of 960 km/h consumes air at the rate of 54.5 kg/s calculate i) Exit velocity of the jet when the enthalpy change for the nozzle is 200 KJ/kg and velocity coefficient is 0.97 ii) fuel flow rate in kg/s when air fuel ratio is 75:1 iii) Thrust specific fuel consumption iv) Propulsive power v) Propulsive Efficiency	6M	20ME405.5	L3
	OR			
15 (a)	With a neat diagram explain the working of rocket engine.	6M	20ME405.5	L2
15 (b)	Derive expressions for the thrust and propulsion efficiency of rockets and compare with those of turbojet.	6M	20ME405.5	L3

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	EEE, CSE & CSE (DS)		Academic Year	2021 - 2022
Course Code	20EE404	Test Duration	3 Hrs.	Max. Marks 70	Semester	IV
Course	Inductions Motors and Synchronous Machines					

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Find the Median of the Marks of a Students in a class given as 60,72,96,28,35,10,40,9,85,25	20BSX11.1	L2
2	If the Mean of a Poisson variable is 1.8 then find $P(x=5)$	20HSX11.2	L2
3	Define the terms Estimate, Estimator and Estimation	20HSX11.3	L1
4	What is the test statistic in testing the significant difference between two population means in large samples?	20HSX11.4	L1
5	What is the difference between negative and Positive correlation?	20HSX11.5	L1

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Calculate the variance and Standard deviation of the following continuous frequency distribution 	Class Interval	30-40	40-50	50-60	60-70	70-80	80-90	90-100	 	Frequency	3	7	12	15	8	3	2		8M	20BSX11.1	L3
6 (b)	Find the Arithmetic Mean, Mode and quartile deviation of the following 9,7,11,13,2,4,5,5?	4M	20BSX11.1	L2
	OR			
7	Calculate the Karl Pearson's coefficient of Skewness for the following data 	Variable	0-10	10-20	20-30	30-40	40-50	50-60	60-70	 	Frequency	5	6	11	21	35	30	22		12M	20BSX11.1	L2
8 (a)	If X is a continuous random variable with p.d.f $f(x)=kx^2e^{-x}$ when $x \geq 0$ find (i) k (ii) Mean (iii) Variance	4M	20BSX11.2	L2
8 (b)	A random variable X has the following Probability distribution 	x	0	1	2	3	4	5	6	7	8	 	P(x)	a	3a	5a	7a	9a	11a	13a	15a	17a	 (i)Determine the value of a (ii) $P(x<3), P(x \geq 3)$ (iii) Find the distribution function F(x)	8M	20BSX11.2	L3
	OR			
9 (a)	State and prove Bayes theorem	9M	20BSX11.2	L2
9 (b)	The contents of urns I, II and III are as follows: 1 white, 2 black and 3 red balls, 2 white, 1 black and 1 red balls 1 white, 5 black and 3 red balls. One urn is chosen at random and two balls drawn. They happen to be white and red. What is the probability that they come the urns I, II or III?	3M	20BSX11.2	L3
10	A Population consists of five members 2,3,6,8 and 11.Consider all possible samples of size two each can be drawn with replacement from the population find (a) Population mean (b) Standard deviation of the population	12M	20BSX11.3	L2

	(c) The mean of the sampling distribution of means (d) The Standard deviation of the sampling distribution of means									

<div align="center">OR</div>

11	Fit a Poisson distribution and find the goodness of fit to the following data <table><tr><td>X</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>f</td><td>275</td><td>72</td><td>30</td><td>7</td><td>5</td><td>2</td><td>1</td></tr></table>	12M	20BSX11.3	L2

12 (a)	A certain stimulus administered to each of the 12 patients resulted in the following increase of blood pressure:5,2,8,-1,3,0,-2,1,5,0,4,6 Can it be concluded that the stimulus will, in general. be accompanied by an increase in blood pressure?.	9M	20BSX11.4	L2
12 (b)	What is the difference between null and alternative hypothesis?	3M	20BSX11.4	L1

<div align="center">OR</div>

13 (a)	Samples of two types of electric light bulbs were tested for length of life and following data were obtained: <table><tr><td></td><td>Sample-I</td><td>Sample-II</td></tr><tr><td>Sample number</td><td>8</td><td>7</td></tr><tr><td>Sample means</td><td>1234hrs</td><td>1036hrs</td></tr><tr><td>Sample SD's</td><td>36hrs</td><td>40hrs</td></tr></table>Is the difference in means significant to warrant that type-1 is superior to type-2 regarding length of life?	9M	20BSX11.4	L2
13 (b)	What are type-1 and type-2 errors in hypothesis testing?	3M	20BSX11.4	L1

14 (a)	What are the properties of regression coefficients?	3M	20BSX11.5	L2
14 (b)	The equations of two regression lines obtained in correlation analysis are as follows $3x + 12y = 19$ $3y + 9x = 46$ Find (a) Correlation coefficient (b) means of X and Y(c) SD's of X and y (d) regression coefficients	9M	20BSX11.5	L3

<div align="center">OR</div>

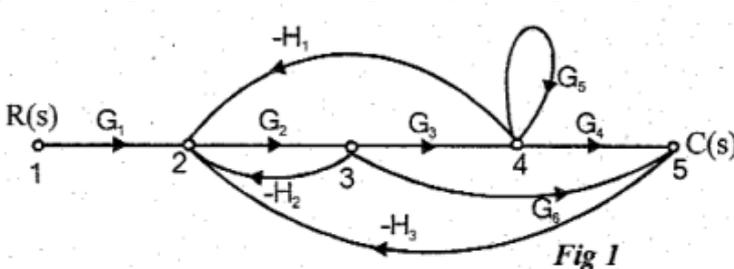|				
15 (a)	Fit a straight line to the following data by using the principle of least squares <table><tr><td>X</td><td>1</td><td>2</td><td>3</td><td>4</td><td>6</td><td>8</td></tr><tr><td>Y</td><td>2.4</td><td>3</td><td>3.6</td><td>4</td><td>5</td><td>6</td></tr></table>	9M	20BSX11.5	L3
15 (b)	Write the normal equations in fitting a parabola by using the principle of least squares	3M	20BSX11.5	L2

Semester End Model Question Paper

NSRIT

Degree	B. Tech. (U. G.)	Program	EEE			Academic Year	2021 - 2022
Course Code	20EE403	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	Control Systems						

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Write the analogous electrical elements in force voltage analogy for the elements of mechanical translational systems	20CS403.1	L1
2	Define following 1. Ramp signal 2. Parabolic signal	20CS403.2	L1
3	What are the difficulties faced while applying R-H criteria?	20CS403.3	L1
4	What is compensation? What are the different types of compensators?	20CS403.4	L1
5	Define concept of observability	20CS403.5	L1

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

No.	Questions (6 through 11)	Learning Outcome (s)	DoK
6 (a)	Find the overall gain C(S)/R(S) for the given signal flow graph fig.1 Fig 1	20CS403.1	L3
6 (b)	Explain open loop and closed loop control systems with one example.	20CS403.1	L2
	OR		
7 (a)	Write the differential equations governing the mechanical rotational systems in shown in below fig.1 obtain the transfer function Fig 1.	20CS403.1	L2
7 (b)	Explain about synchro pair.	20CS403.1	L2
8 (a)	Obtain the response of under damped 2nd order system to the unit step input	20CS403.2	L2
8 (b)	Obtain the steady state errors of type-0 system, type -1 and type-2 systems for the unit ramp input signal	20CS403.2	L2
	OR		
9 (a)	For the given closed loop control T.F find out the damping ratio and natural frequency of oscillation. $$\frac{200}{s^2 + 20s + 200}$$	20CS403.2	L3
9 (b)	Explain about PID controller.	20CS403.2	L2
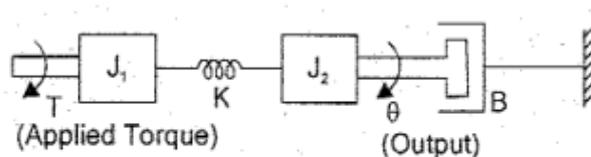
10	The open loop transfer function of unity feedback control system is given by $$G(s) = \frac{K}{s\,(s^2 + 4s + 13)}$$ Sketch the root locus	20CS403.3	L3
	OR		
11 (a)	The open loop transfer function of unity feedback control system is given by $$G(s) = \frac{K(s+1)}{s^3 + as^2 + 2s + 1}$$ Find the value of K so that the system oscillates at a frequency of 2 rad/sec.	20CS403.3	L3
11 (b)	The characteristic polynomial of a system is $s^7 + 5s^6 + 9s^5 + 9s^4 + 4s^3 + 20s^2 + 36s + 36 = 0$ Determine the location of roots on the S plane and hence the stability of the system	20CS403.3	L3
12 (a)	Explain about frequency domain specifications	20CS403.4	L2
12 (b)	Plot the bode diagram for the following transfer function and obtain the gain and phase cross-over frequencies $$G(s) = \frac{10}{s\,(1 + 0.4s)\,(1 + 0.1s)}$$	20CS403.4	L3
	OR		
13	The open loop transfer function of unity feedback control system is given by $$G(s) = 1/s(1+s)\,(1+2s)$$ Draw the polar plot and Find the G.M and P.M.	20CS403.4	L3
14 (a)	What is state transition matrix? Write its properties.	20CS403.5	L2
14 (b)	Determine the state representation of a continuous time linear time invariant system with system function $$G(S) = \frac{3S + 7}{(S+1)(S+2)(S+5)}$$	20CS403.5	L3
	OR		
15	State equation of a control system is given by $$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -6 & 5 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$ Obtain the state transition matrix.	20CS403.5	L3

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	ECE		Academic Year	2021 - 2022
Course Code	20EC404	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	Electromagnetic Waves & Transmission Lines					

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define loss less line and write the primary and secondary constants at this Condition?	20EC404.1	L1
2	Define VSWR. Give the relationship between VSWR and Reflection coefficient.	20EC404.2	L1
3	State the point form of Ampere's circuital law	20EC404.3	L1
4	What is skin depth? Mention its importance	20EC404.4	L1
5	What are the applications of poynting theorem?	20EC404.5	L1

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	The constants per km of a certain cable are: R = 6.75ohms; L = 5.5mH; C = 0.00872 µfd and G = 0.4µmhos. Calculate the Characteristic impedance, attenuation constant and phase velocity when w = 5000 radians per second	6M	20EC404.1	L3
6 (b)	Derive the condition for distortion less transmission line and also plot the open circuit short circuit wave forms of voltage and current at the receiving end.	6M	20EC404.1	L3
OR				
7 (a)	Define and explain both lossless and distortion less transmission lines in terms of transmission line parameters.	6M	20EC404.1	L2
7 (b)	A transmission line in which no distortion is present has the following parameters $Z_0 = 60Ω$, α = 20m NP/m, v = $0.7v_0$. Determine R,L,G,C and wavelength at 0.1 GHz.	6M	20EC404.1	L2
8 (a)	What is Smith Chart? How it is used to find the impedance of transmission line?	6M	20EC404.2	L3
8 (b)	A 50 Ω coaxial cable feeds a 75 + j20 Ω dipole antenna. Find reflection coefficient and standing wave ratio.	6M	20EC404.2	L2
OR				
9 (a)	The VSWR measured of UHF transmission line, working at a frequency of 300MHz is found to be 2. If the distance between load and voltage minimum is 0.8 meter. Calculate the value of load impedance.	6M	20EC404.2	L3
9 (b)	Explain Quarter wave and half wave Transmission Line.	6M	20EC404.2	L3
10 (a)	Point charges 1 mC and -2mC are located at (3,2,-1) and (-1,-1,4) , respectively. Calculate the electric force on a 10nC charge located at (0, 3, 1) and the electric field intensity at that point.	6M	20EC404.3	L3
10 (b)	Establish Gauss Law in point form and integral form hence deduce Laplace's and Poisson's Equations.	6M	20EC404.3	L2
OR				
11 (a)	State and explain Coulomb's Law. Define electric field intensity giving the units of various parameters involved.	6M	20EC404.3	L2
11 (b)	Two uniform line charges of density 8nC/m are located in a plane with y=0 at x= ± 4m. Find the Electric field at a point P(0m, 4m, 10m).	6M	20EC404.3	L2

12 (a)	Find an expression for the magnetic field produced by a straight current carrying conductor at a distance x from it.	6M	20EC404.4	L2
12 (b)	State Maxwell's equations and give expressions for magneto static fields.	6M	20EC404.4	L2
OR				
13 (a)	State and Derive the boundary condition for electric and magnetic field at any surface of discontinuity.	6M	20EC404.4	L3
13 (b)	Derive Maxwell's equations in Integral and Differential forms for time varying fields.	6M	20EC404.4	L3
14 (a)	A uniform plane wave propagating in a medium has E = 2e-αzsin (108t-βz)ay V/m. If the medium is characterized by εr= 1, μr= 20 and σ = 3 S/m, find α, β and H.	6M	20EC404.5	L3
14 (b)	Derive the expression for attenuation and phase constants of uniform plane wave.	6M	20EC404.5	L3
OR				
15 (a)	Explain the different types of polarization.	6M	20EC404.5	L2
15 (b)	Define uniform plane wave. Prove that uniform plane wave does not have field component in the direction of propagation.	6M	20EC404.5	L2

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	ECE		Academic Year	2020 - 2021
Course Code	20EC405	Test Duration	3 Hrs.	Max. Marks 70	Semester	IV
Course	Electronic Circuit Analysis					

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define millor's Theorm	20EC405.1	L1
2	What is cascade amplifier?	20EC405.2	L1
3	Write the difference between positive and negative feedback amplifier	20EC405.3	L1
4	Define oscillator	20EC405.4	L1
5	List any two types of tuned amplifiers	20EC405.5	L1

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Derive the expressions for the following hybrid Π conductance i) gm ii)gb'e iii) gb'c iv)gce	6M	20EC405.1	L2
6 (b)	Give the Analysis of common Source Amplifier circuit at high frequencies	6M	20EC405.1	L2
OR				
7 (a)	With suitable expressions explain CE short circuit current gain	6M	20EC405.1	L2
7 (b)	Obtain frequency response of Common Emitter amplifier circuit and find out its Bandwidth	6M	20EC405.1	L2
8 (a)	Discuss about the effect of cascading on bandwidth of multistage amplifiers	6M	20EC405.2	L2
8 (b)	Explain two stage RC coupled amplifier and derive the expressions for voltage gain	6M	20EC405.2	L2
OR				
9 (a)	With suitable expressions explain direct coupled amplifier	6M	20EC405.2	L2
9 (b)	Derive the expression for input resistance, output resistance, voltage gain and current gain of a Darlington pair amplifier	6M	20EC405.2	L3
10 (a)	Explain the characteristics of Negative feedback amplifier	6M	20EC405.3	L2
10 (b)	Derive the expressions for R_{if} and R_{of} for Voltage shunt feedback amplifier	6M	20EC405.3	L2
OR				
11 (a)	Draw the circuit for Voltage shunt feedback amplifier and derive the expressions for A_f and β for the circuit.	6M	20EC405.3	L3
11 (b)	Compare the four types of feedback topologies with respect to basic amplifier, R_{if} and R_{of}	6M	20EC405.3	L2
12 (a)	Establish the condition for frequency of oscillation in an RC phase shift oscillator	6M	20EC405.4	L3
12 (b)	Derive the expression frequency of oscillation and condition for sustained oscillations of a FET based RC Phase shift oscillator	6M	20EC405.4	L3
OR				
13 (a)	Derive the frequency of oscillation of Hartley oscillator	6M	20EC405.4	L3
13 (b)	Derive the expression for frequency of oscillation and condition for sustained oscillations of a Colpitts oscillator	6M	20EC405.4	L3
14 (a)	Show that the conversion efficiency of a transformer coupled power amplifier is 50%.	6M	20EC405.5	L3
14 (b)	Draw and explain working of class B push pull amplifier	6M	20EC405.5	L2
OR				
15 (a)	Describe the operation of complementary symmetry class B push pull amplifier	6M	20EC405.5	L2

| 15 (b) | Describe the operation of staggered tuned amplifier | 6M | 20EC405.5 | L2 |

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	ECE			Academic Year	2021 - 2022
Course Code	20EC403	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	**Pulse and Digital Circuits**						

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is meant by linear wave shaping?	20EC405.1	L1
2	Classify clipper circuits based on the connection of the active device. Mention their uses.	20EC405.2	L1
3	What is meant by quasi stable state?	20EC405.3	L1
4	What is meant by sweep time and restoration time?	20EC405.4	L1
5	Define propagation delay, Fan-in and Fan-out of logic circuit.	20EC405.5	L1

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Show that the RC high pass circuit acts as a differentiator.	6M	20EC405.1	L1
6 (b)	Explain and draw the circuit diagram of emitter coupled clipper its operation.	6M	20EC405.1	L2
	OR			
7 (a)	Explain the response of High-pass RC circuit for square wave input.	6M	20EC405.1	L2
7 (b)	Demonstrate the circuit of different types of shunt clippers and explain their operation with the help of their transfer characteristics.	6M	20EC405.1	L2
8 (a)	Explain the design of the transistor switch.	6M	20EC405.2	L2
8 (b)	What is the function of Commutating Capacitors?	6M	20EC405.2	L1
	OR			
9 (a)	Write a short note on Transistor Switching Times.	6M	20EC405.2	L2
9 (b)	Explain the working of fixed bias Bistable Multivibrator with the help of neat diagram.	6M	20EC405.2	L2
10 (a)	Derive an expression for overshoot.	6M	20EC405.3	L2
10 (b)	What is rounding? How the rounding distortion is eliminated in a stable multivibrator?	6M	20EC405.3	L2
	OR			
11 (a)	Derive the expression for gate width of a monostable multivibrator.	6M	20EC405.3	L3
11 (b)	Draw the circuit diagram of collector coupled astable multivibrator and derive the expression for frequency of oscillations.	6M	20EC405.3	L2
12 (a)	Draw the exponential sweep circuit and derive the expression for transmission error.	6M	20EC405.4	L2
12 (b)	Explain the basic principles behind Bootstrap time base generator.	6M	20EC405.4	L2
	OR			
13 (a)	Derive the relation between slope transmission and displacement errors.	6M	20EC405.4	L3
13 (b)	With a neat sketch explain about transistor Miller time base generator.	6M	20EC405.4	L2
14 (a)	Explain the 2-input NAND gate of DTL family.	6M	20EC405.5	L2
14 (b)	Explain about any 3 application of sampling gates in detail.	6M	20EC405.5	L2
	OR			
15 (a)	Draw the circuit diagram of two input Diode OR gate and explain it.	6M	20EC405.5	L2
15 (b)	Explain the operation of six diode sampling gate.	6M	20EC405.5	L2

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	CSE			Academic Year	2021 - 2022
Course Code	**20CS402**	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	**Data Warehousing and Data Mining**						

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is Discretization?	20CS402.1	L1
2	List all the approaches for filling missing values	20CS402.2	L1
3	What is Rule based classification?	20CS402.3	L1
4	What is Market Basket Analysis?	20CS402.4	L1
5	Write about cluster Analysis, list various techniques of cluster Analysis	20CS402.5	L2

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What is Data Warehouse? Explain the Snowflake Schema.	6M	20CS405.1	L2
6 (b)	What is Data Cube? Explain Multidimensional Data Model	6M	20CS405.1	L2
	OR			
7 (a)	List and explain various steps involved in Building Data Warehouse.	6M	20CS405.1	L2
7 (b)	What is OLTP and OLAP? Explain the various operations of OLAP.	6M	20CS405.1	L2
8 (a)	What is Data Mining and explain about knowledge Discovery process.	6M	20CS405.2	L2
8 (b)	Write about Data Mining issues.	6M	20CS405.2	L2
	OR			
9 (a)	Write various techniques involved in Data Transformation and Data Reduction	6M	20CS405.2	L2
9 (b)	What is Data Visualization and various methods of data visualization.	6M	20CS405.2	L2
10 (a)	State the Baysian Theorem and discuss how baysian theorem work	6M	20CS405.3	L2
10 (b)	What is decision Tree and with example and describe algorithm for generating decision tree	6M	20CS405.3	L2
11 (a)	Explain the Classification by propagation with diagram.	6M	20CS405.3	L2
11 (b)	What is Classification and explain how it is different from clustering	6M	20CS405.3	L2
12 (a)	Can we design a method that mines the complete set of frequent item sets wit candidate generation? If yes, explain it with the following table: TID — List of items 001 — milk, dal, sugar, bread 002 — Dal, sugar, wheat, jam 003 — Milk, bread, curd, paneer 004 — Wheat, paneer, dal, sugar 005 — Milk, paneer, bread 006 — Wheat, dal, paneer, bread	6M	20CS405.4	L2
12 (b)	What is association Rule? Write three Association Rules for above Data (in Question Number 12 (a))	6M	20CS405.4	L2
	OR			
13 (a)	What is apriori principle? Explain how Association Rules are generated using apriori algorithm.	6M	20CS405.4	L2
13 (b)	Explain the various applications with examples relating to Association Analysis (Rules)	6M	20CS405.4	L2

14 (a)	What is outlier Analysis and what are outlier detection methods?	6M	20CS405.5	L2
14(b)	What is Density Based Clustering? Explain DBSCAN Clustering Algorithm	6M	20CS405.5	L2
OR				
15 (a)	Explain K-Means Algorithm	6M	20CS405.5	L2
15 (b)	Describe any one Hierarchical Clustering Algorithm	6M	20CS405.5	L2

MODEL QP

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	CSE/CSE (AI&ML)/CSE (DS)	Academic Year	2021 - 2022
Course Code	20CS302	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	Operating Systems				

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define OS.	20CS302.1	L1
2	What is Thread?	20CS302.2	L1
3	Define critical section.	20CS302.3	L1
4	What is paging?	20CS302.4	L1
5	List any two access methods.	20CS302.5	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 various operating system operations.	6M	20CS302.1	L2
6 (b)	Explain the various operating system services.	6M	20CS302.1	L2
	OR			
7	What is system call? Explain various types of system calls.	12M	20CS302.1	L2
8 (a)	What is a process? Explain about various fields of Process Control Block.	6M	20CS302.2	L2
8 (b)	Discuss Multithreading Models with neat diagrams	6M	20CS302.2	L2
	OR			
9 (a)	What are the advantages of inter-process communication? How communication takes place in a shared-memory environment? Explain.	6M	20CS302.2	L2
9 (b)	What is a scheduler? List and describe different types of schedulers.	6M	20CS302.2	L2
10 (a)	What is a Critical Section problem? Give the conditions that a solution to the critical section problem must satisfy.	6M	20CS302.3	L2
10 (b)	What is Dining Philosophers problem? Discuss the solution to Dining philosopher's problem using semaphores.	6M	20CS302.3	L2
	OR			
11 (a)	Describe producer-consumer problem. Explain how to solve it	6M	20CS302.3	L2
11 (b)	Discuss Banker's algorithm for dead lock avoidance.	6M	20CS302.3	L2
12 (a)	What is a Virtual Memory? Discuss the benefits of virtual memory technique	6M	20CS302.4	L2
12 (b)	What is Thrashing? What is the cause of Thrashing? How does the system detect Thrashing? What can the system do to eliminate this problem?	6M	20CS302.4	L2
	OR			
13 (a)	What is demand paging? Discuss the hardware support required to support demand paging.	6M	20CS302.4	L2
13 (b)	Illustrate the page-replacement algorithms i) LRU ii) LRU-Approximation Page Replacement. Use the reference string 7, 0,1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2,1, 2, 0, 1, 7, 0,1 for a memory with three frames.	6M	20CS302.4	L2

14	Explain various file access methods with suitable examples.	12M	20CS302.5	L2
	OR			
15	Write short notes on: i) FCFS and ii) SSTF Disk Scheduling schemes.	12M	20CS302.5	L2

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	CSE		Academic Year	2021 - 2022
Course Code	20CS405	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	Theory of Computation					

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define alphabet, string and Grammar	20CS405.1	L1
2	What is ambiguous grammar?	20CS405.2	L1
3	What is the decidable and un decidable problem?	20CS405.3	L2
4	Define Compiler	20CS405.4	L1
5	What is DAG?	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)	1.Construct DFA for the String accepts Even number of 0's and Even number of 1's 2.Construct DFA for the Sub String 001	6M	20CS405.1	L1
6 (b)	Write the equivalence of NFA and DFA	6M	20CS405.1	L2
OR				
7 (a)	Convert the given NFA to DFA	6M	20CS405.1	L2
7 (b)	Minimize the Given DFA.	6M	20CS405.1	L3
8 (a)	What is Push down Automata. Explain with Graphical Notation	6M	20CS405.2	L2
8 (b)	What is Chomsky Normal form? Convert the given CFG to CNF $S \rightarrow XA /BB$, $B \rightarrow b/SB$, $X \rightarrow b$, $A \rightarrow a$	6M	20CS405.2	L2
OR				
9 (a)	1. What is ambiguous grammar .Check whether the given grammar is ambiguous or not $S \rightarrow S+S/S*S/a/b$ 2. Construct LMD,RMD for $S \rightarrow 0B/1A, A \rightarrow 0S/1AA, B \rightarrow 1/1S/0BB$	6M	20CS405.2	L3

9 (b)	Write the Equivalence of PDA and CFG	6M	20CS405.2	L2
10 (a)	What is Turing Machine? Explain with Model	6M	20CS405.3	L2
10 (b)	Design Turing Machine for the Language L={0^n1^n/ n>=1}	6M	20CS405.3	L2
	OR			
11 (a)	Explain Types of Turing Machine and Universal Turing machine	6M	20CS405.3	L2
11 (b)	Explain halting problem in Turing Machine	6M	20CS405.3	L2
12 (a)	Consider the following fragment of 'C' code: floati,j;i=i*70+j+2; Write the output at all phases of the compiler for the above 'C' code.	6M	20CS405.4	L2
12 (b)	Write short notes on Input Buffering	6M	20CS405.4	L2
	OR			
13 (a)	Describe various phases of a compiler	6M	20CS405.4	L2
13 (b)	Construct recursive descent parser for the following grammar. E -> T E' E' -> +T E'|e T -> F T' T' -> *FT'|e F -> (E)|id	6M	20CS405.4	L3
14 (a)	Give the rules for computation of FIRST(X) and FOLLOW(X). Construct FIRST and FOLLOW sets for the following grammar. E->TE' E'->+TE'|e T->FT' T'->*FT'|e F -> €|id	6M	20CS405.5	L3
14(b)	Write a short note on type checking and abstract Syntax tree		20CS405.5	L2
	OR			
15 (a)	Compare and contrast the quadruples, triples & indirect triples	6M	20CS405.5	L2
15 (b)	What is Peephole Optimization? Explain	6M	20CS405.5	L2

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	CSE			Academic Year	2021 - 2022
Course Code	20CS302	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	Design and Analysis of Algorithms						

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define time complexity and space complexity	20CS302.1	L1
2	State Master theorem	20CS302.2	L1
3	Write the general method of dynamic programming	20CS302.3	L2
4	What are NP Hard problems?	20CS302.4	L1
5	Write the general principle of branch and bound technique	20CS302.3	L2

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

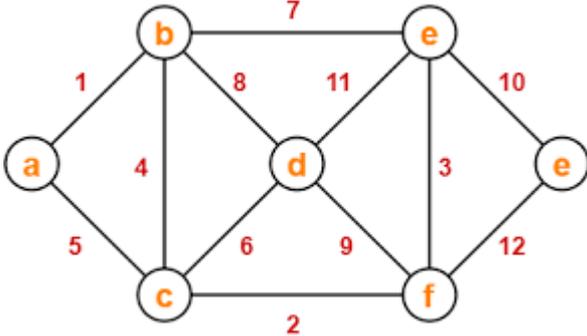| No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Describe the asymptotic classes. Give example	6M	20CS302.2	L2
6 (b)	Write the recursive algorithm to find factorial of given number and analyze its time complexity	6M	20CS302.2	L2
	OR			
7 (a)	Write the String-matching algorithm. Explain it with example	6M	20CS302.2	L2
7 (b)	Apply bubble sort algorithm to sort the characters of "EXAMPLE"	6M	20CS302.2	L2
8 (a)	Find the topological ordering of vertices of given graph	6M	20CS302.4	L3
8 (b)	Sort the given array using quick sort algorithm (24, 9, 29, 14, 19, 27)	6M	20CS302.4	L3
	OR			
9 (a)	Explain Karatsuba's algorithm to multiply 2 large integers	6M	20CS302.4	L3
9 (b)	Apply the algorithm to find the product of 1234 and 8765	6M	20CS302.4	L3
10	Explain Prim's algorithm to find the minimum cost spanning tree. Apply it to the following graph	12M	20CS302.3	L3
	OR			
11	Design a dynamic programming based algorithm to solve 0/1 knapsack problem. Apply it solve the following problem N=5, W=6, weight vector = (3,2,1,4,5), cost vector = (25,20,15,40,50)	12M	20CS302.3	L3
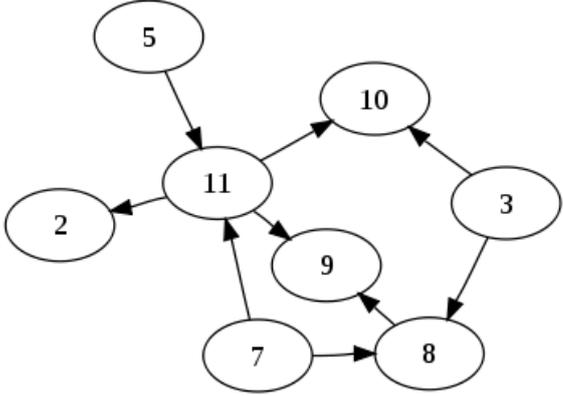
12	Describe approximation algorithms for NP-Hard graph problems	12M	20CS302.5	L2
	OR			
13 (a)	State and describe Cook's theorem	6M	20CS302.5	L2
13 (b)	Explain NP Complete problems with examples	6M	20CS302.5	L2
14 (a)	Describe the least-cost based branch and bound strategy	4M	20CS302.3	L2
14 (b)	Solve the following problem by designing an algorithm using appropriate design strategy There are 4 jobs that are to be assigned to 4 persons a, b, c, d. The cost involved in assignment is given below. Find the optimal assignment $$C = \begin{bmatrix} 9 & 2 & 7 & 8 \\ 6 & 4 & 3 & 7 \\ 5 & 8 & 1 & 8 \\ 7 & 6 & 9 & 4 \end{bmatrix} \begin{matrix} person\ a \\ person\ b \\ person\ c \\ person\ d \end{matrix}$$ job 1 job 2 job 3 job 4	8M	20CS302.4	L3
	OR			
15 (a)	State n-Queen's problem statement	4M	20CS302.3	L2
15 (b)	Generate at least 2 solutions to 8-Queen's problem and draw its state-space tree	8M	20CS302.4	L3

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	CSM & CSD		Academic Year	2021 - 2022
Course Code	20CS502	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	Computer Networks					

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
	OR			
7 (a)	Explain the functions of various layers in ISO-OSI reference model	6M	20CS502.1	L2
7 (b)	Discuss about Data link Layer services	6M	20CS502.1	L2
8 (a)	Explain Error control & Flow Control Mechanisms	6M	20CS502.2	L2
8 (b)	Explain about Cyclic Redundancy Check with an example	6M	20CS502.2	L2
	OR			
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 about FTP & HTTP?	5M	20CS502.3	L2
	OR			
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	L2
12 (a)	Explain IPv4 datagram format.	6M	20CS502.4	L2
12 (b)	Elements of Transport protocols	6M	20CS502.4	L2
	OR			
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 Modelling	7M	20CS502.5	L2
14 (b)	Explain TCP Timer Management	5M	20CS502.5	L2
	OR			
15 (a)	Explain about DNS	7M	20CS502.5	L2
15 (b)	Explain Email Architecture	5M	20CS502.5	L2

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	EEE			Academic Year	2021 - 2022
Course Code	20EE404	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	INDUCTIONS MOTORS AND SYNCHRONOUS MACHINES						

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Why an Induction motor is called as rotating transformer?	20EE404.1	L1
2	Define the phenomenon of crawling	20EE404.2	L1
3	List any four applications of shaded pole motor	20EE404.3	L1
4	Why synchronous motor is not self-starting motor?	20EE404.4	L1
5	What are the applications of synchronous condenser?	20EE404.5	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 constructional feature of wound rotor three phase induction motor.	6M	20EE404.1	L2
6 (b)	A three-phase induction motor has a starting torque of 100% and a maximum torque of 200% of the full-load torque. Determine: i) slip at which maximum torque occurs ii) full-load torque and iii) rotor current at starting in per unit of full-load rotor current.	6M	20EE404.1	L3
	OR			
7 (a)	Explain the points of similarities between a transformer and an induction machine. Hence, explain why an induction machine is called a generalized transformer.	6M	20EE404.1	L2
7 (b)	Develop the expression for torque in an induction motor and also derive the condition for maximum torque.	6M	20EE404.1	L2
8 (a)	Explain the speed control of induction motor with V/f control method.	7M	20EE404.2	L2
8 (b)	Explain the operation of Direct-on-line starter with a neat sketch.	5M	20EE404.2	L2
	OR			
9 (a)	3-f , 15.38 kW, 415V, 50Hz star connected Induction motor yielded the following data on testing. No load test: 415V 7.4A, $\cos f_0 = 0.25$ Blocked rotor test: 220V 48A $\cos f_0 = 0.42$ From the circle diagram find i) line current, ii) Power factor and iii) Efficiency at rated load?	6M	20EE404.2	L3
9 (b)	Compare the relative merits and demerits of cage rotor and wound rotor induction motors of the same power rating	6M	20EE404.2	L2
10 (a)	Explain the principle of operation of single-phase induction motor based on "double revolving field theory".	6M	20EE404.3	L2
10 (b)	A 230 V, 50 Hz, 4-pole, single phase motor has the following equivalent circuit parameters: $R_1 = 2.2W$, $X_1 = 3.1W$ and $X_m = 80 W$ $R'_2 = 4.4W$, $X'_2 = 2.6W$ If the motor is running at 1450 rpm, calculate (i)Slip, (ii) input current, (iii) power factor, (iv) input power, (v) output power and (vi) efficiency. Assume the friction, windage and core losses to be 50W.	6M	20EE404.3	L3
	OR			
11 (a)	Explain the construction and working of a split phase single phase induction motor.	6M	20EE404.3	L2

11 (b)	Explain the equivalent circuit of a single-phase induction motor with neat sketch.	6M	20EE404.3	L2
12 (a)	Write about the Constructional details of rotor of both non-salient and salient pole synchronous machine.	7M	20EE404.4	L2
12 (b)	What is armature reaction? Explain the effect of armature reaction on the terminal voltage of an alternator at different p.f conditions.	6M	20EE404.4	L2
OR				
13 (a)	Explain the voltage regulation by synchronous impedance method of an alternator	6M	20EE404.4	L2
13 (b)	What do you mean by synchronizing of alternator? Describe any one method of synchronizing	6M	20EE404.4	L2
14 (a)	Explain with neat sketches the principle of operation of a 3-phase synchronous motor	6M	20EE404.5	L2
14 (b)	The synchronous reactance per phase of a 3-phase, star connected 6600 V synchronous motor is 20 ohms. For a certain load the input is 900 kW at normal voltage and the induced line emf is 8500 V. Determine the line current and power factor	6M	20EE404.5	L3
OR				
15 (a)	Illustrate the performance of a synchronous motor using V and inverted V curves.	7M	20EE404.5	L2
15 (b)	Explain the various starting methods of synchronous motor.	5M	20EE404.5	L2

Semester End Examination Model Paper

Degree	B. Tech. (U. G.)	Program	EEE			Academic Year	2021 - 2022
Course Code	20EE405	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	Electro Magnetic Field Theory						

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

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	State Coulomb's law in electrostatic fields	20EE405.1	L1
2	What is equation of continuity?	20EE405.2	L1
3	Define Magnetic flux and Magnetic flux density	20EE405.3	L1
4	What is self-inductance?	20EE405.4	L1
5	What is Maxwell 4th equation?	20EE405.5	L1

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

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Derive the expression for electric field due to an infinite line charge	12M	20EE405.1	L2
	OR			
7	Derive the expression for electric field due to an infinite surface charge	12M	20EE405.1	L2
8 (a)	Derive the expression for capacitance of a spherical capacitor	6M	20EE405.2	L2
8 (b)	Derive the boundary conditions of electric filed between a perfect dielectric material and a conductor.	6M	20EE405.2	L2
	OR			
9 (a)	Derive the expression for capacitance of parallel-plate capacitor.	6M	20EE405.2	L2
9 (b)	Define electric dipole. Derive the expression for electric field due to electric dipole.	6M	20EE405.2	L2
10	Derive an expression for magnetic flux density at any point on the axis of a plane circular current loop	12M	20EE405.3	L2
	OR			
11 (a)	Determine the expression for H due to uniform sheet of surface current	6M	20EE405.3	L2
11 (b)	State and explain Biot-savart's law.	6M	20EE405.3	L2
12 (a)	A long solenoid with length I and a radius R consists of N turns of wire, a current pass through the coil. Find the inductance.	6M	20EE405.4	L3
12 (b)	Derive the equations for energy stored and energy density in magnetic field.	6M	20EE405.4	L2
	OR			
13 (a)	Derive the expression of mutual inductance between a straight long wire and a square loop wire.	6M	20EE405.4	L2
13 (b)	A solenoid with N_1 = 2000, r_1 = 2 cm and L_1 = 100 cm is concentric within a second coil of N_2 = 4000, r_2 = 4 cm and L_2 = 100 cm. find mutual inductance assuming free space conditions	6M	20EE405.4	L3
14 (a)	Explain about Statically induced EMF.	5M	20EE405.5	L2
14 (b)	Explain about Faraday's laws of electromagnetic induction.	7M	20EE405.5	L2
	OR			
15 (a)	Explain about Dynamically induced EMF	5M	20EE405.5	L2
15 (b)	Starting from Faraday's law of electromagnetic induction, derive Maxwell equation $\nabla \times E = -\partial B / \partial t$.	7M	20EE405.5	L2