Code No. 11379 / CBCS / BL

FACULTY OF ENGINEERING

B.E. II – Semester (CBCS) (Backlog) Examination, May/June 2019

Subject: Engineering Chemistry – II

Time: 3 Hours **Max.Marks: 70**

Note: Answer all questions from Part-A and any five questions from Part-B

PART – A (10x2 = 20 Marks)

1 The resistance of a conductivity cell filled with 0.1N solution of KCl is 210 ohms at 25^{o}C Calculate the equivalent conductance of the KCl solution, if the cell constant is 0.88cm^{-1}

2 Represent the Saturated Calomel Electrode and write its electrode reaction for reduction process.

3 What are fuel cells? Explain their advantages.

4 Explain the conversion of solar energy in photovoltaic cell.

5 Explain the waterline corrosion.

6 Write the four factors affecting the rate of corrosion.

7 Define the terms i) HCV ii) LCV.

8 Write the composition of CNG and mention its uses.

9 Define composite material.

10 Explain the effect of dilution on equivalent and specific conductance.

PART – B (5x10 = 50 Marks)

11 a) The equivalent conductivities at infinite dilution (λ_∞) for NH_4Cl, NaOH and NaCl are 125.6, 221.8 and 109.1 ohm^{-1} cm2.eq^{-1} respectively. Calculate the degree of dissociation constant, if the equivalent conductance (λ_V) of 0.01N NH_4OH is 9.33 ohm^{-1} cm^2 eq^{-1}. 5

b) Explain Kholrausch law and write its two applications. 5

12 a) Describe the construction and working of lead-acid battery with discharging and charging reactions. 6

b) Explain methanol-oxygen fuel cell and write its reactions for oxidation, reduction processes. 4

13 a) What is dry or chemical corrosion? Explain with an example. 5

b) What is paint? What are its constituents and their functions? 5

14 a) Explain ultimate analysis of coal and give its significance. 6

b) Write a note on Galvanizing and Galvanic corrosion. 4

15 a) Classify the liquid crystals and give their applications. 4

b) Explain the concept and principles of green chemistry and write two examples of clean green technology. 6

16 a) Explain the determination of pH of a solution using glass electrode. 6

b) What is quinhydrone electrode and write its reactions for oxidation and reduction processes. 4

17 a) What is cathodic protection? Explain the impressed current cathodic protection. 6

b) A sample of coal was found to contain the following composition. C= 80%, H= 5%, O = 1%, N = 2% and ash = 12%. Calculate minimum amount of air required for complete combustion of 1kg coal sample. 4

****

Code No. 11013/BL

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) I-Semester (Backlog) Examination, May / June 2019

Subject: Strength of Materials – I

Time: 3 hours **Max. Marks: 75**

Note: Answer all questions from Part-A and any FIVE questions from Part-B.

PART-A (25 Marks)

1. Differentiate between ductile and brittle material with sketch 3
2. Write a relationship between elastic constants 2
3. Explain the types of supports of a beam. 3
4. Give the examples for a statically determinate beam. 2
5. Define the core of a section 2
6. State the assumptions of analysis of trusses. 3
7. Differentiate between thin cylinder and thick cylinder 3
8. Write an expression of hoop stress and axial stress for a thin cylinder 2
9. Explain maximum shear stress theory of failure 3
10. Show the variation of shear stress across a solid circular shaft of diameter D and subjected to a twisting moment T. 2

PART- B (50 Marks)

11. a) Define a compound bar and explain the analysis of a compound bar with a sketch 5
    b) A mild steel rod of 30 mm diameter and 500 mm long is encased centrally inside a hollow copper tube of external diameter 50 mm and thickness 5 mm. If allowable stress in the rod and the tube is 100 MPa and 50 MPa respectively, calculate the amount of load the compound bar can support Also calculate corresponding compression of the compound bar. Take Young's modulus for steel and copperas 200 GPa and 100 GPa respectively. 5

12 A cantilever beam of 6m span and of uniform rectangular cross section 200mm wide and 400 mm deep is loaded with an anti-clock wise couple of 30 kNm at its free end. In addition to this, it carries a uniformly varying load of intensity zero at free end and to 5 kN/m at the other end. Plot the shear force and bending moment diagrams, indicating the principal values. 10

13 A 200 mm wide and 300 mm deep timber beam is strengthened with 6 mm thick and 200 mm wide steel plate at the bottom. Take modular ratio as 20. Draw equivalent timber section and determine flexural stresses at extreme fibers of timber and steel, if the section is subjected to a bending moment of 40 kNm. Also draw flexural stress distribution diagram for the above section. 10

…2

14 A wooden beam 300 mm x 400 mm is simply supported over a span of 8 m. The beam supports two concentrated loads of 20 kN and 50 kN at a distance of 3m and 6 m from left support respectively. Determine maximum bending stress and shear stress developed in the beam. Also draw bending stress and shear stress distribution diagrams at respective critical locations. 10

15 a) Derive an expression for maximum shear stress and volumetric strain of a thin cylinder subjected to an internal pressure 5

b) A cylindrical shell 3 m long and 100 cm internal diameter and 10 mm metal thick ness is subjected to internal pressure of 2 N/mm^2. Determine maximum shear stress induced and percentage change in volume of the shell. Young's modulus and Poisson's ratio is 204 GPa and 0.3 for material of the shell respectively. 5

16 Draw Mohr's circle of stress for direct stresses of 50 N/mm^2 (tensile) and 20 N/mm^2 (tensile). From the Mohr's circle of stress, extract (i) the magnitude and direction of resultant stress on a plane making an angle of 60^o with the plane of the minor principal stress, (ii) The magnitude and direction of maximum shear stress and (iii) The normal and resultant stresses on a plane of maximum shear stress. 10

17 Write the assumptions of theory of pure torsion and derive the simple torsion equation for circular shaft. 10

****

Code No. 11019/BL

FACULTY OF ENGINEERING

B.E. 2/4 (EEE) I - Semester (Backlog) Examination, May / June 2019

Subject : Principles of Mechanical Engineering

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A & any five questions from Part-B.

PART – A (25 Marks)

1 Define COP of a refrigerator.
2 Define Convection heat transfer processes.
3 What are the advantages of Multistage compression?
4 Explain in brief the process of generation of steam.
5 What is epicyclic gear train? Give one application example.
6 What are different types of belt drives?
7 Define Reynolds number, state its significance.
8 What is draft tube? Where it is used?
9 Why priming is required in centrifugal pumps?
10 Define slip in reciprocating pumps.

PART – B (50 Marks)

11 (a) Differentiate between parallel flow and counter flow heat exchangers with diagram.
(b) Explain the working of vapour compression Refrigeration system with the help of P-H and T-S diagrams.

12 (a) Differentiate 4-Stroke engines with respect to (i) cycle (ii) fuel (iii) Power
(b) State ten advantages of closed cycle compared to open cycle gas turbines.

13 Derive the expression for length of belt for open belt drive.

14 (a) Explain the working of Venturiment. State its applications.
(b) An inward flow reaction turbine has external and internal diameter as 1m and 0.5m respectively. The velocity of flow through the runner is constant and its equal to 1.5m/s determine.
(i) Discharge through the runner and
(ii) Width of the turbine at outlet if the width of turbine at inlet = 200mm

15 (a) Explain the functions of air vessels in reciprocating pumps with the help of a diagram.
(b) A centrifugal pump is to discharge $0.118m^3$/sat a sped of 1450 rpm against a head of 25m. The impeller diameter is 250mm, its at outlet in 50mm and manometric efficiency is 75%. Determine the vane angle at the outer periphery at the impeller.

16 (a) Explain ten eco friendly refrigenrants.
(b) Explain the working of a constant pressure gas turbine.

17 (a) A shaft running at 200 rpm is to drive a parallel shaft at 300 rpm. The pulley on the driver shaft is 60cm diameter. Calculate the diameter of the pulley on the driven shaft:
(i) Neglecting belt thickness
(ii) Taking belt thickness into account, which is 5mm thick.
(iii) Assuming in the latter case a total slip of 4%.
(b) Explain the working principle of Kaplan turbine with a diagram.
(c) Explain the working principle of centrifugal pumps with a sketch.

*****

Code No: 11021/BL

FACULTY OF ENGINEERING

BE 2/4 (Inst.) I-Semester (Backlog) Examination, May / June 2019

Subject: Elements of Production Techniques

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A, & Any Five Questions from Part-B.

PART-A (25 Marks)

1. Classify different manufacturing processes with suitable examples. (3)
2. Explain the procedure to make sand moulds? (2)
3. What is filler metal? Explain its importance in welding. (3)
4. State different flames in gas welding and their applications. (2)
5. State the concept of FMS. (3)
6. Define cutting speed, feed and depth of cut. (3)
7. Differentiate between LBM and EBM (2)
8. What are the applications of ultrasonic machines? (2)
9. Write the applications of rolling and powder metallurgy processes. (3)
10. Define extrusion processes. (2)

PART-B (50 Marks)

11. *a) Sketch and explain the solidification process in sand casting.* (5)
    b) Write the functions of pattern and explain the desirable properties of a pattern material. (5)

12. a) State and explain gas welding process. (5)
    b) Distinguish between welding, brazing and soldering. (5)

13. a) Explain the working principle of milling process. (5)
    b) Differentiate between NC, CNC and DNC? (5)

14. *a) Sketch and explain abrasive jet machining.* (5)
    b) List out the advantages, disadvantages and applications of USM. (5)

15. a) Define forging. What are the advantages of the forging of metals? (5)
    b) What are the various methods of manufacture of metal powders? Explain. (5)

16. a) Differentiate between consumable and non-consumable electrodes. (5)
    b) Write the applications and limitations of casting. (5)

17. Write short notes on the following: (10)
    (a) FMS
    (b) Deep drawing
    (c) Resistance welding.

****

Code No. 11026/BL

FACULTY OF ENGINEERING

B.E 2/4 (ECE) I-Semester (Backlog) Examination, May / June 2019

Subject: Elements of Mechanical Engineering

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A and any five questions from Part-B

PART-A (5 x 5 = 25 Marks)

1. Define Clausius inequality for reversible and irreversible processes.
2. Draw valve timing diagram of four stroke diesel engine and port timing diagram of two stroke petrol engine.
3. Explain the Newton's law of cooling with an example.
4. Define LMTD and effectiveness of parallel flow heat exchanger.
5. Estimate COP of Bell Coleman cycle for the pressure ratios 4.28 & 6.28, take γ=1.4.
6. In a psychometric process the partial pressure of water vapor =21.28mm of Hg, atmospheric pressure=760mm of Hg. Determine the specific humidity of air.
7. List any four engineering applications of grinding machine.
8. Sketch die casting machine and label the parts.
9. Distinguish between compound gear train and inverted gear train.
10. Define kinematic pair and kinematic link.

Part-B (5 x 10 = 50 Marks)

11 a) Describe the working of three stage air compressor with schematic diagram and also draw the P-v diagram. 4

b) A six cylinder gasoline engine operates on the four stroke cycle. The bore of each cylinder is 80mm and stroke is 100mm, speed is 4500rpm and the torque produced by the engine is 160N-m. Determine i) Brake Power ii)Brake mean effective pressure. 6

12 a) A wall of a refrigerated van of 1.6mm of steel at outer surface, 12 mm plywood at a inner surface and 20mm of glass wool in between. Calculate the rate of heat flow if the temperature at the inside and outside surface is -5ºC and 34ºC respectively. Take K (Steel)=27.2W/m ºC, K(Glass wool)=0.024W/m ºC and K(Plywood)=0.055W/mºC. 6

b) Derive the expression for the LMTD of Counter flow heat exchanger. 4

…2

13 a) Discuss the working of Practical Vapor absorption system with a neat diagram. 6

b) Sketch the following processes on psychrometry chart.
i) Sensible heating ii) Heating and humidification
iii) Cooling and dehumidification iv) Sensible cooling. 4

14 a) Explain the various operation carried out on i) lathe machine and ii) milling machine. 4

b) Describe the working of a gas welding process and sketch various flames generated during the process. 6

15 a) A flat belt 10mm thick and 80mm wide transmits power two pulleys running at 1500m/min. The angle of lap on the smaller pulley is 160º.The maximum permissible stress in the belt is 1500KN/m^2.Estimate i) Initial tension in the belt ii)Maximum power transmitted by the belt drive. Take mass of the belt as 0.86kg/m length and μ=0.25. 6

b) Describe the working of epicyclic gear train. 4

16 a) Describe the working of four stroke diesel engine with a sketch in each stroke. 5

b) The inner surface of a furnace wall is at 300ºC and outer surface is dissipating heat by convection into air at 25ºC.The wall is 45mm thick and has thermal conductivity of 2.24W/m-K. Estimate the minimum value of heat transfer coefficient at the outer surface if outer surface temperature should not exceed 85ºC. 5

17. Answer any two of the following: 5+5

a) Explain the physical and thermodynamic properties of refrigerants.
b) Discuss the Extrusion and wire drawing operations with their applications.
c) Explain the classification and applications of gear trains.

****

Code No: 11031/BL

FACULTY OF ENGINEERING

BE 2/4 (M/P/A.E) I-Semester (Backlog) Examination, May / June 2019

Subject: Managerial Economics and Accountancy

Time: 3 Hours **Max. Marks: 75**

Note: Answer All Questions From Part-A & Any Five Questions From Part-B.

PART- A (25 Marks)

1. What is the Importance of Define Opportunity Cost Concept. 3
2. State Income Elasticity of Demand 3
3. What is Monopoly? 2
4. Write the formula of Profitability Index Method 2
5. What are the rules of Trial Balance? 3
6. What is Book – Keeping 2
7. Write about Cobb - Doughlas Production Function 3
8. Managerial Economics 2
9. Consumers goods demand and Producers goods demand 3
10. Journalising 2

PART- B (5 x 10 = 50 Marks)

11. State the significance of managerial economics in decision making in various fields.
12. Define Price Elasticity of Demand and discuss the types and uses of Price Elasticity of Demand.
13. What is meant by the Long – run Production Function? Explain
14. What is perfect Competition? Explain the features of a perfectly competitive market.
15. Calculate the Profit-Volume Ratio and Break – Point from the following details.
    Fixed Cost = Rs. 3,00,000
    Variable Cost = Rs. 20
    Selling Price per unit = Rs. 30
16. There are three projects A,B,C. The cost of the project is Rs. 20,000 in each case. The cash inflows are as follows.

Year	PROJECT A	PROJECT B	PROJECT C
	Rs	Rs	Rs
1	5,000	8,000	6,000
2	5,000	6,000	4,000
3	5,000	4,000	5,000
4	5,000	2,000	5,000
5	5,000	1,000	2,000

Calculate Payback Period of each project and compare the results.

…2

17 From the following balances of Gupta, Prepare the Trading and Profit and Loss a/c as on 31.03.2016

Particulars	Amount (Rs.)
Opening Stock	20,000
Salaries	25,000
General Expenses	2,000
Rent and Taxes	3,000
Purchases	90,000
Freight Inward	2,500
Advertising	1,500
Sales	1,85,000
Discount allowed	1,800
Discount received	1,000
Adjustments :	
Closing Stock Rs. 18,000	

****

Code No. 11038/BL

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I – Semester (Backlog) Examination, May / June 2019

Subject: Basic Electronics

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1	Explain the working of ZENER diode as regulator.	2
2	What is a Bleeder resistor of Rectifier?	2
3	What are the differences between BJT and JFET?	2
4	What are the limitations of H-parameters?	2
5	What are the differences between Positive feedback and negative feedback?	2
6	Draw the equivalent circuit for Crystal oscillator. Write the equations for its Oscillations	3
7	What are the applications of OP-AMP?	3
8	What are Basic logic gates? Write their truth table.	3
9	What is Photo diode? Draw its symbol and write any two uses.	3
10	What is Temperature Transducer?	3

PART – B (5x10 = 50 Marks)

11	Draw a neat circuit for Bridge rectifier .Derive the I_{dc} ,V_{dc}, I_{rms}, Ripple factor, PIV.	10
12 a)	Draw a neat circuit diagram for equivalent h parameter model of Common Base circuit. Derive A_V, A_I, R_i, R_o.	5
b)	Explain the construction and working of P-channel JFET.	5
13	Draw a neat circuit diagram of the Wein bridge oscillator and derive the frequency of oscillations.	10
14 a)	Draw the Full adder using half adders and logic gates.	5
b)	Implement the Full adder using only Nand gates.	5
15 a)	What is UJT? Explain operation.	5
b)	Explain the V-I Characteristics of SCR.	5
16 a)	Explain the construction and working of LVDT.	5
b)	Draw a neat block Diagram of CRO and explain its working.	5

17) Write short notes on:

a)	Thermal runaway in BJT	3
b)	LCD	3
c)	Types of Filters.	4

****

Code No. 11042/BL

FACULTY OF ENGINEERING

B.E. 2/4 (IT) I Semester (Backlog) Examination, May / June 2019

Subject: Data Structures

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B

Part – A (25 Marks)

1. Define an ADT and write the string ADT operations. 3
2. What are the applications of queues? 3
3. What are the operations on AVL trees? 3
4. Define a minimal spanning tree and give an example. 2
5. What are the stack ADT operations? 2
6. What are the elementary graph operations? 2
7. What are the disadvantages of linear representation of queue and how can you overcome it? 3
8. What are the different binary tree traversals? 2
9. What are the advantage of using templates in C++? 2
10. What are the advantages of linked list implementation of a stack over the linear array implementation? 3

Part – B (50 Marks)

11.a) What are asymptotic notations? Explain with examples. 4
b) What are the applications of Stacks? Explain any two applications. 6

12. a) Write an algorithm to add and subtract two polynomials using linked list. 7
b) Explain about subtyping and inheritance in C++ 3

13. a) What is a binary search tree? Give an example. 4
b) What are the three traversal techniques? Explain for the example taken above. 6

14. a) Explain the DFs and BFs traversals of a graph with an example. 4
b) Write the Kruskal's algorithm for finding a minimum spanning tree and find the cost of an MST for any example using Kruskal's algorithm. 6

15. a) Write an algorithm to implement queue using linked lists. 6
b) Show the result of inserting the following elements into an initially empty AVL tree. 4
2, 1, 4, 5, 9,3, 6, 7

16. a) Write a C++ function for merge sort and trace the algorithm for the following elements.
12, 2, 45, 1, 34, 56, 7, 85, 23, 15 7
b) Explain the best computing time for sorting 3

17. Write short notes on the following
a) Algorithm specification 3
b) Applications of queues 4
c) Hash function 3

****