Code No. 35

FACULTY OF ENGINEERING

B.E. II/IV(EEE) I – Semester (Backlog) Examination, May/June 2018
Subject: Principles of Mechanical Engineering

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

Note: (i) Answer All Questions From Part-A & Answer Any five Questions From Part-B.
(ii) Missing date, if any may suitably be assumed.

PART – A (25 Marks)

1. Derive the expression for the Isothermal compression process.
2. State the merits of gas turbines over I.C. engines
3. Write briefly about heat exchanger
4. Define slip and creep of a belt
5. Sketch the compound gear train
6. State some applications of Bernoulli's equation
7. What is draft tube? What are its functions?
8. What is priming? Why is it necessary?
9. Write about Eco-friendly refrigerants
10. Differentiate between SI and CI Engines

PART – B (50 Marks)

11. a) What are different laws of thermodynamics? What is their significance and scope?

    b) Explain briefly an air refrigeration working on a Reversed Carnot cycle. Also derive the expression for its COP.

12. a) Explain the working of a 4-stroke SI engine with the help of a neat sketch.
    b) Describe the working of a two stroke engine and sketch its indication diagram

13. a) Derive an expression for the length of a cross-belt drive.
    b) The tension on tight side of a belt is 300kg and the angle of lap is 160^0. If the coefficient of friction is 0.3 find the tension on the slack side of the belt.

14. a) Differentiate between frames, keplam, pelton wheel turbine with respect to power efficiency for high head.
    b) What is venturimeter? Derive an expression for the discharge through a venturimeter

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15. a) Why air vessels are used on the suction and delivery pipes of a reciprocating pump?

    b) Explain the working principle and construction details of a centrifugal pump with a neat sketch.

16. a) Describe merits and demerits of air refrigeration system
    b) A two stroke cycle internal combustion engine has a mean effective pressure (m.e.p.) of 4.5 bar. The speed of the engine is 800 rpm. If the diameter of piston and stroke are 75mm and 90mm respectively. Find the indicated power developed.

17. Write **short notes** on the following
    a) Air standard cycles
    b) Reynolds number and its significance
    c) Applications of refrigeration.

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Code No. 37

FACULTY OF ENGINEERING

B.E. 2/4 (Inst.) I – Semester (Backlog) Examination, May/ June 2018
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. What are the broad classifications of manufacturing?
2. What are the functions of core and core prints?
3. Differentiate between brazing and soldering.
4. What is the significance of electrode and flux in arc welding?
5. Differentiate between up and down milling
6. What are the advantages of CNC machining?
7. What is the principle of material removal in EBM?
8. What is the need for unconventional machining processes?
9. What are the applications of forging?
10. What are the classifications of forming?

PART-B (50 Marks)

11 a). What are the criteria for selection of process for manufacturing a product?
b). Sketch and explain die casting process

12 a). Explain Brazing and soldering method of forining
b). Explain spot welding with near metch.

13 a). Explain the quick return motion mechanism in shaper
b). Discuss different types of taper turning operations.

14 a). Sketch and explain the working principle of AJM
b). Sketch and explain the working principle of EDM

15. a). What are the differences between forward and backward extrusion?
b). What is the difference between casting and forging?

16. a).What are the applications and limitations of casting?
b).What are the different operations that can be performed on Lathe Machine, Explain?

17. Write short notes on the following.
(a) Dividing Head
(b) Wire Drawing
(C) Consumable and Non-Consumable Electrodes

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Code No. 42

FACULTY OF ENGINEERING

B.E 2/4 (ECE) I – Semester (Backlog) Examination, May / June 2018
Subject : Elements 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. What are the advantages of Multistage compressors
2. State Clausius Inequality for a reversible, irreversible and impossible processes
3. Distinguish between Natural convection and forced convection heat transfer
4. Write the classification of heat exchangers
5. Write any five application of refrigeration and air conditioning
6. Write the classification of refrigerants
7. Compare sand casting system with die casting system
8. Sketch any one drilling machine and mention important components
9. Define velocity ratio of a compound belt drive and slip of it
10. Compare gear trains with belt drives

Part - B (50 Marks)

11. a) Describe the working of a single stage reciprocating air compressors with a neat sketch (4)
    b) A four cylinder, four stroke gasoline engine operates at 3000rpm. The bore of each cylinder is 10 cm and the stroke is 2 cm. The clearance volume of each cylinder is 100 CC. The fuel consumption is 20kg/hr and the torque developed is 150 N –m. Determine i) B.P ii) BMEP iii) Brake thermal efficiency Assume C.V. of fuel as 43000 kJ/kg. (6)

12 a) Explain the modes of heat transfer in the following
i) Metal rod is heated at $50^{o}C$ ii) Water is boiling at $100^{o}C$ iii) Furnace wall is maintained at $800^{o}C$ (6)
b) Derive the expression for the LMTD of a counter flow heat exchanger and also state the assumptions made (4)

13 a) Describe the working of aqua- ammonia VAR system and mention its applications (7)
b) Compare Vapor compression refrigeration system with Thermoelectric refrigeration system (3)

14 a) Explain with a neat diagram the working of ARC welding system and also mention its engineering applications (6)
b) Sketch any one casting process and explain its working (4)

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15 a) A pulley is driven by a flat belt running at a speed of 800 m/min. The coefficient of friction between the pulley and belt id 0.23 and angle of lap is 165^0. If the maximum tension in the belt is 1200N. Find the power transmitted by the sketch the belt system (6)
b) Explain the working of Epicyclical gear train and mention its applications (4)

16 a) In a gas turbine the flow rate of air is 6 kg/s. The velocity and enthalpy of air at entrance are 350 m/sec and 7930 kJ/kg respectively. At exit the velocity is 180 m/sec and enthalpy is 5045 kJ/kg. As the air passes through the turbine a loss of heat equal to 40 kJ/kg occurs. Find the power developed by the turbine (7)
b) Write the applications of compressed air (3)

17 Write short notes on any two of the following 5+5
a) Eco friendly refrigerants
b) Working of milling machine
c) Derivation of Length of open belt

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Code No: 59

FACULTY OF INFORMATICS

B.E. 2/4 (IT) I-Semester (Backlog) Examination, May/June 2018

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. What is the algorithm specification? (3)
2. Define time complexity and space complexity of an algorithm. (2)
3. Define Abstract Data Type (ADT) and give an example. (2)
4. What are the different types of linked lists? (3)
5. Differentiate static hashing and dynamic hashing. (2)
6. Define complete binary tree and full binary tree. (2)
7. How is shell sort different from insertion sort? (3)
8. What is an internal sort and give examples of internal sorting mechanisms? (3)
9. Define a sparse matrix and give an example. (2)
10. Evaluate the postfix expression xyz*+ where x=2, y=3 and z=4 and show the stack contents while evaluation. (3)

PART-B (50 Marks)

11. a. Write a C++ program to implement linked stack. (7)
    b. Explain the different representations of graphs. (3)

12. a. What is hashing? Explain the process of overflow handling in hashing. (7)
    b. Define maxheap and minheap. Give examples. (3)

13. a. Explain the operations on an AVL Tree. (6)
    b. What are the different types of linked lists? Explain briefly. (4)
14. a. Explain how stack is used to convert the following infix expression to postfix.
    a+b*c+(d*e+f)*g (6)

    b. Write the Prim's algorithm for finding a minimal spanning tree. (4)

15. a. What are the operations on a Red-Black Tree? Explain. (5)
    b. Explain the BFS and DFS traversals of a graph with an example. (5)
16. Write algorithms for insertion and deletion into a binary search tree. Explain with example. (10)

17. Write short notes on the following.
    a) Threaded Binary trees (3)

    b) Splay Trees (4)
    c) Stack ADT (3)

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Code No. 48

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/AE) I - Semester (Backlog) Examination, May / June 2018

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	Economics is science of material welfare explain.	2
2	Managerial economics and its relation with other sciences.	2
3	What are the factors of production?	2
4	What is contribution?	2
5	Write the important determinants of demand.	2
6	Sources of capital.	3
7	Write the rules of accounting.	3
8	Define monopoly.	3
9	Write about subsidiary books.	3
10.	Write Journal entries for the following transactions. 2016 Jan 1. sold goods to Ravinder for cash Rs.3,000 2. purchase furniture from Manoj Rs..5,000 3. paid wages Rs.2,000	3

PART- B (50 Marks)

11 Define managerial economics. Explain the fundamental principles of managerial economics

12 What is elasticity of demand? Explain the different kinds of elasticity of demand.

13 What is perfect market? Write the features of perfect market.

14 A limited company has submitted the following information
Sales Rs.1,80,000 Variable cost Rs. 1,44,000 fixed cost Rs. 24,000
You are required to calculate: (a) p/v ratio (b) Breakeven point (c) value of sales to earn a profit of Rs.24,000 (d) Margin of safety

15 A decision is to be made between two competing projects which require equal investment of Rs.50,000 and are expected to generate net cash flows are under.

Year	1	2	3	4	5	6
Project - I	25,000	15,000	10,000	Nil	12,000	6,000
Project - II	10,000	12,000	18,000	25,000	8,000	4,000

The cost of return on capital of the company is 10% which project should be chosen? Evaluate the project proposal under Net present value method.

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16 Prepare Bank Reconciliation Statement as on 30-12-2006
(a) Bank balance as per pass book Rs.15,000
(b) Cheques deposited but not collected by the bank Rs1,500 upto 31-12-2016
(c) Cheques issued but not presented for payment Rs.1,700
(d) Interest on investment credited in pass book Rs.100 and bank charges debited in passbook Rs. 25

17 The following Trial Balance was extracted from the books of Mr.S. Kumar as on 31-12-2015.

Particulars	Rs.	Particulars	Rs.
Machinery	25,000	Kumar's Capital	58,100
Buildings	20,000	Sales	85,000
Purchases	50,000	Purchase returns	800
Sales Returns	600	Sundry creditors	8,000
Opening Stock	18,000		
Power And Fuel	2,000		
Sundry Debtors	5,000		
Salaries	6,000		
Wages	8,000		
Rent	1,000		
Cashat Bank	5,000		
Cash On Hand	2,500		
Carriage Outwards	1,500		
Drawings	4,000		
Insurance	1,300		
General Expenses	2,000		
	1,51,900		**1,51,900**

Prepare Trading, Profit & Loss account for the year ending 31-12-2015 and balance sheet as on that date

Adjustments:
1) Closing stock Rs.27,000
2) Depreciate machinery 10%
3) unexpired insurance Rs.100
4) outstanding rent Rs.200
5) Write off bad debts Rs.1200
6) charge interest on capital at 5%

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Code No. 55

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I - Semester (Backlog) Examination, May / June 2018

Subject : Basic Electronics

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

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

PART – A (25 Marks)

1	Draw the energy band diagrams of n-type and p-type semiconductors.	2
2	Define the terms a) PIV b)% regulation c) Form Factor	3
3	Draw the various current components which flow across the transistor.	3
4	Define the FET parameters a) Transconductance b) Amplification factor	2
5	Explain Barkhausen Criterion.	2
6	An amplifier has an open loop gain of 1000 and a feedback ratio of 0.04. If the open loop gain changes by 10% due to temperature, find % change in gain with feedback. Also, find the amount of feedback introduced in dB.	3
7	Write the limitations of Operational amplifier in open loop configuration.	2
8	Draw the truth tables of basic logic gates and realize using NAND gates.	3
9	Explain the working of a Photo diode.	3
10	Write the applications of C.R.O	2

PART- B (50 Marks)

11	(a) Explain the characteristics of a PN-junction diode under Forward and reverse bias conditions.	5
	(b) Describe the working of Capacitor filter with Full Wave Rectifier. Also derive the expression for ripple factor.	5
12	(a) Explain the working of JFET and also describe the drain and transfer characteristics.	6
	(b) Explain the input and output characteristics of CB configuration.	4
13	(a) Draw the block diagram of a feedback amplifier and explain the functioning of each block. Also derive the equation for gain with feedback.	5
	(b) Describe the working of Hartley Oscillator, derive the equation for frequency of oscillations and also derive the condition for sustained oscillations.	5
14	(a) Write about the application of Op-amp as an instrumentation amplifier. With neat circuit diagram, obtain the expression for output voltage.	5
	(b) Draw the truth table of Full subtractor and realize using NAND gates	5
15	(a) Explain the working and V-I characteristics of SCR.	5
	(b) With neat block diagram, describe the working of C.R.O.	5
16	(a) Explain the working of Zener voltage regulator.	5
	(b) Prove that transistor acts as an amplifier.	5
17	Write short notes on	
	(a) Crystal oscillator	4
	(b) Op-amp as an Adder	3
	(c) Strain gauges	3

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Code No. 30

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) I – Semester (Backlog) Examination, May / June 2018

Subject: Strength of Materials – I

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

Note: i) Answer all questions from Part A and any five questions from Part B.
ii) Answers to questions of Part-A must be at one place and in the same order as they occur in the question paper.
iii) Missing data, if any, may suitably be assumed.

PART – A (25 Marks)

1 A railway is laid so that there is no stress in the rails at 20^{o}C. Calculate the stress in the rails at 50^{o}C if there is an expansion allowance of 8 mm per rail.
$\alpha = 12 \times 10^{-6}$ / ^{o}C, $E = 2 \times 10^{5}$ N/mm^2. The rails are 30 m long.

2 Differentiate between yield strength and ultimate strength.

3 Compute the maximum shear force in a cantilever of span L subjected to a clockwise moment M at the centre.

4 What is point of contra flexure in a beam subjected to lateral loading?

5 Sketch the shear stress distribution across circular and I sections.

6 When the method of sections is preferred over method of joints in analysis of trusses?

7 List out any two assumptions involved in the Lame's theory of thick cylinders.

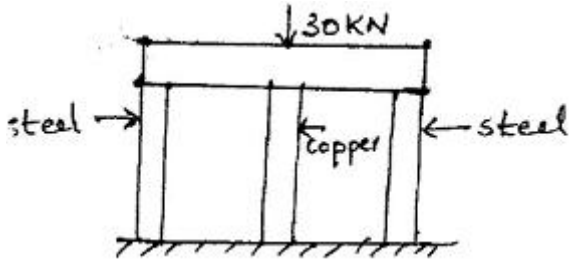
8 Compute the thickness of a thin seamless pipe of 1 m dia if it has to carry a fluid under a pressure of 3 N/mm^2. Allowable stress is 100 N/mm^2.

9 Construct Mohr circle for a state of stress at a point in a loaded specimen where two mutually perpendicular planes are subjected to principal stresses of 50 N/mm^2 and 30 N/mm^2 both compressive.

10 What is complimentary shear stress?

PART – B (5x10 = 50 Marks)

11 A load of 30 kN is jointly supported by three vertical rods equal in length, each 25 mm diameter, and equidistant in a vertical plane. Initially the rods are so adjusted as to share the load equally. The outer rods are of steel and the middle one is of copper. Calculate the total stresses in each rod if a further load of 15 kN is added. The Ec = 110 kN/mm^2; Es = 205 kN/mm^2.



12 a) Derive the relationship between Modulus of Elasticity, Modulus of Rigidity and Poisson's ratio of an elastic body.

b) A bronze specimen has a Modulus of Elasticity of 120 kN/mm^2 and a Modulus of rigidity of 47 kN/mm^2. Determine the Poisson's ratio of the material.

13 A beam AB of 6 m span carries a distributed load with an intensity increasing from zero at A to 30 kN/m at B. Find the reactions and the location and value of maximum bending moment. Plot the B.M. and S.F. diagrams.

14 Compare the flexural strength of the following three beams of equal weight.

i) I-Section 15 cm x 20 cm, having 2 cm as flange thickness and 1 cm as web thickness.
ii) Rectangular section having depth equal to twice the width.
iii) Solid circular section.

15 A cast iron pipe of 200 mm internal diameter and 25 mm metal thickness is under a tensile stress of 50 N/mm^2. Calculate the stresses set up in pipe, if water under a pressure of 3 N/mm^2 is admitted into the pipe.

16 A propeller shaft 25 cm external diameter and 15 cm internal diameter transmit 1500 kW power at 100 r.p.m. There is at the same time a bending moment of 10 kN-m and an end thrust of 300 kN. Find:
i) The principal stresses and their planes
ii) The maximum shear stress
iii) The stress which acting alone will produce the same maximum strain.
Take 1/m = 0.3.

17 A beam with I-Section with dimensions 19 cm x 61 cm has 2.7 cm thick flanges and 1.5 cm thick web. Calculate the maximum intensity of shear stress and sketch the distribution of shear stress across the section, the shear force at the cross section being 600 kN.

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