

III B. Tech I Semester Regular Examinations November - 2015
STRUCTURAL ANALYSIS – II
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

PART –A

- 1 a) What is the effect of temperature on three hinged arch? [3M]
- b) What are the steps involved in portal frame method? [4M]
- c) What is a suspension bridge? What is its limitation of span over a waterway? [3M]
- d) Define and explain stiffness, carry over factor and distribution factor. [5M]
- e) What is Kani's method and what is the terminology used in Kani's method? [4M]
- f) Write the steps involved in flexibility matrix method. [3M]

PART -B

- 2 a) A three hinged parabolic arch rib has a span of 84m and a rise 18m to the central pin at the crown. The rib carries load of intensity 2kN/m uniformly distributed horizontally over a length of 1/3 of the span from the left hand. Calculate the bending moments in the rib at the quarter span points. [12M]
- b) What is the difference between three hinge arch and two hinge arch? [4M]
- 3 a) Explain the portal method for analyzing a building frame subjected to horizontal forces. [12M]
- b) What do you understand by substitute frame method? [4M]
- 4 a) What is a general cable theorem? Deduce an expression. [12M]
- b) What are stiffening girders? Discuss their types. [4M]
- 5 A simply supported beam ABC is continuous over two spans AB and BC of 6m and 5m respectively. Span AB is carrying a uniformly distributed load of 2kN/m and span BC carries point load of 5kN at a distance of 2m from B. Find the support moment at B if EI of the beam is constant. Use moment distribution method. [16M]



- 6 Using the Kani's method analyse the frame shown in fig.1.

[16M]

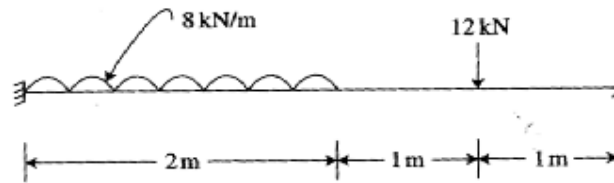


Fig.1

- 7 a) Write the steps involved in analyzing the stiffness method. [6M]
 b) Using stiffness matrix method find the end moments at A and B for the given beam as shown in fig.2 [10M]

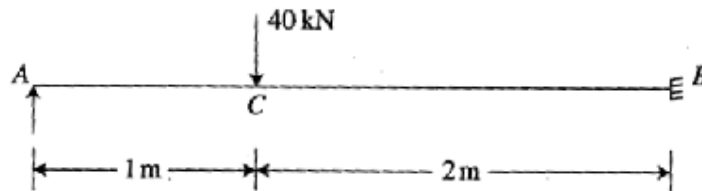


Fig.2

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PART -A

- | | | |
|---|--|------|
| 1 | a) What is the effect of rib shortening on two hinged arch? | [3M] |
| | b) What are the steps involved in cantilever method? | [4M] |
| | c) Explain suspension cable on roller support with figures. | [3M] |
| | d) What is a portal frame? Distinguish between symmetrical and unsymmetrical portal frame. | [5M] |
| | e) What is Kani's method and what is the terminology used in Kani's method? | [4M] |
| | f) Write the steps involved in Stiffness matrix method. | [3M] |

PART -B

- | | | |
|---|--|-------|
| 2 | a) A two hinged parabolic arch rib has a span of 10m has a central rise 2.5m. It is loaded with uniformly distribute load 2kN/m over a half of the span from the left support. Determine the end reactions, horizontal thrust, maximum and minimum B.M of the arch. | [12M] |
| | b) Explain briefly what do you understand by an arch? | [4M] |
| 3 | a) Explain the cantilever method for analyzing a building frame subjected to horizontal forces. | [12M] |
| | b) What are the different types of substitute frames? | [3M] |
| 4 | a) What is a general cable theorem? Deduce an expression. | [8M] |
| | b) What are stiffening girders? Discuss their types. | [5M] |
| 5 | A simply supported beam ABC is continuous over two spans AB and BC of 8m and 6m respectively. Span AB is carrying a uniformly distributed load of 3kN/m and span BC carries point load of 4kN at midpoint of BC. Find the support moment at B if EI of the beam is constant. Use moment distribution method. | [16M] |



- 6 Using the Kani's method analyse the frame shown in fig.1. [16M]

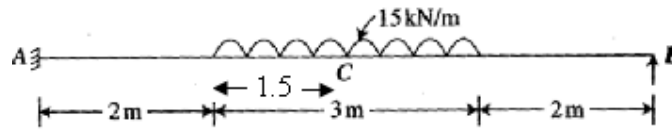


Fig.1

- 7 a) Write the steps involved in analyzing the flexibility matrix method. [8M]
 b) Using flexibility matrix method, find the end moments at A and B for the beam shown in fig.2. [8M]

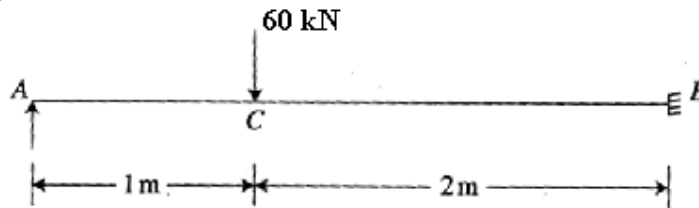


Fig.2

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PART –A

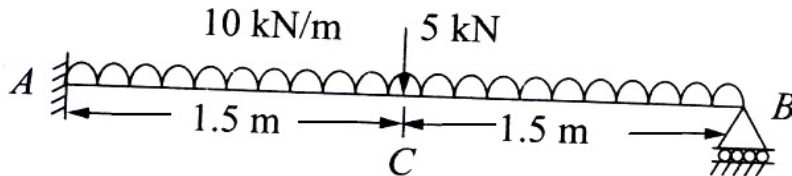
- 1 a) Find the horizontal thrust of a two hinged semi circular arch of radius R carries a concentrated load of W. [4M]
- b) Differentiate between portal frame method and cantilever method. [4M]
- c) What is a simple suspension bridge? [3M]
- d) Write the equations for continuous beam with and without sway. [4M]
- e) What is Kani's method? What are the limitations of this method? [4M]
- f) Differentiate between stiffness matrix method and flexibility matrix method. [3M]

PART –B

- 2 a) State and prove Eddy's theorem. [8M]
- b) A three hinged parabolic arch rib has a span of 20m and a rise 4m to the central pin at the crown. The rib carries load of intensity 2kN/m uniformly distributed horizontally on the left 3m. Calculate the maximum and minimum bending moments. [8M]
- 3 Analyse a portal frame of two storeys, two bay of 5m bay length each and height 5m. A horizontal force of 120kN is applied at top storey and 240kN is applied at lower storey. Use portal frame method [16M]
- 4 A beam ABC 8m long is fixed at A and simply supported at B with an overhang BC 2m long. The beam carries a uniformly distributed load of 12kN/m on AB and a point load of 12kN at C. Find the support moments and the support reaction. Use moment distribution method. [16M]

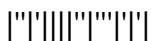


- 5 Analyse the beam shown below by Kani's method. [16M]



- 6 A three hinged suspension girder bridge has a span of 200m over the supports at same level. It has a central dip of 20m. The girder carries three point loads of 15kN, 25kN and 20kN acting at 35m, 80m and 150m respectively from the left end. Draw the B.M.D. [16M]
- 7 a) Using flexibility matrix method, find the end moments at A and B for a fixed beam carrying udl 4kN/m throughout. [10M]
- b) Which method is advantageous among stiffness method and flexibility method? [6M]

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PART -A

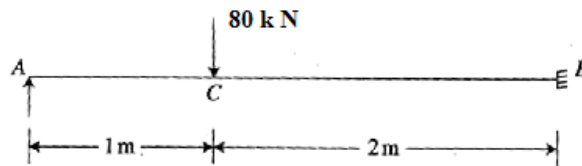
- 1 a) What is a horizontal thrust, normal thrust and radial thrust in a three hinged arch? [3M]
- b) What is a building frame? What are the different methods available for analyzing a frame? [4M]
- c) What is the effect of temperature on the cables? [4M]
- d) What is a carryover factor and distributor factor in a moment distribution method? [4M]
- e) What are the steps involved in the Kani's method? [3M]
- f) What are the steps involved in Stiffness matrix method. [4M]

PART -B

- 2 A three hinged parabolic arch rib has a span of 50m and a rise 20m to the central pin at the crown. The rib carries load of intensity 3kN/m uniformly distributed horizontally on the left 4m. Calculate the (i) maximum and minimum bending moments, (ii) horizontal thrust, (iii) Normal thrust and radial shear at a section 15m from A. [16M]
- 3 Write the steps involved in the Portal frame method and Cantilever method. [16M]
- 4 A fixed beam of span 6m carries a uniformly distributed load of 18kN/m. If the right support sinks by 6.5mm, find the fixing moment of the supports. Draw S.F.D and B.M.D. Take $E = 200 \text{ kN/mm}^2$ and $I = 5 \times 10^7 \text{ mm}^4$. Analyse by moment distribution method [16M]
- 5 A cable hangs between two supports at a distance 120m apart. One end of the support is 3m above the other. The cable is loaded with a udl of 1 kN/m. The sag of the cable from higher end is 5m. Find the horizontal thrust and the maximum tension in the cable. [16M]
- 6 a) Write the steps for analyzing a portal frame carrying a udl by Kani's method. [8M]
- b) Draw S.F.D and B.M.D of the fixed beam of span 'l', carrying u.d.l for a distance of 'a' from one end. Use Kani's method. [8M]



- 7 a) Write the steps involved in analyzing the stiffness matrix method. [8M]
b) Using stiffness matrix method find the end moments at A and B for the given beam [8M]





III B. Tech I Semester Regular Examinations, November - 2015
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
 (Common to EEE, AME and MINE)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) What is Income Demand? How do you determine it? [3M]
 b) What do you mean by Opportunity Cost? Give examples. [4M]
 c) Explain Monopoly competition. [4M]
 d) What is the difference between Partnership and Sole trade? [3M]
 e) What do you mean by Journal? Explain. [4M]
 f) Write a short note on Capital and types of capital. [4M]

PART -B

- 2 a) What is Law of Demand? What are its assumptions? [8M]
 b) Describe any four methods of Demand forecasting. [8M]
 3 a) Explain the internal and external economics of large scale. [8M]
 b) From the following information, calculate Break Even Sales in terms of value and volume. [8M]

	Rs.
Sales	10,00,000
Units sold	5,000
Variable cost / unit	100
Fixed Cost	2,00,000

- 4 a) What is Perfect Competition? Describe its features. [8M]
 b) Explain Market Skimming Pricing. [8M]
 5 a) Discuss the salient features of a Joint Stock Company and its merits. [8M]
 b) Illustrate the different phases in Business Cycles. [8M]
 6 a) Define Capital budgeting. Explain its importance. [8M]
 b) Explain briefly Net Present Value technique of capital budgeting. [8M]



7

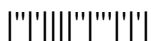
Prepare final accounts for Munni Lal for the year ended 31st March 2012 form the following Trial Balance.

[16M]

<u>Account</u>	<u>Debit (Rs.)</u>	<u>Credit (Rs.)</u>
Cash in hand	10,000	
Purchases	2,00,000	
Sales		3,10,000
Returns Inward	5,000	
Returns outward		10,000
Wages	8,000	
Power	2,000	
Factory Rent	5,000	
Opening Stock	10,000	
Buildings	50,000	
Land	70,000	
Machinery	40,000	
Patents	5,000	
Salaries	8,000	
General Expenses	2,000	
Insurance	3,000	
Drawings	8,000	
Capital		95,000
Debtors		4,000
Creditors		15,000
Total:	4,30,000	4,30,000

Adjustments:

1. Closing Stock Rs. 10,000
2. Depreciate machinery, buildings and patents at 10% p.a
3. Outstanding salaries Rs. 3,000
4. Prepaid insurance Rs. 300
5. Wages outstanding Rs. 1,000.



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PART -A

- | | | |
|---|--|------|
| 1 | a) What are the Determinants of Demand? | [3M] |
| | b) Explain about Production Function. | [4M] |
| | c) What is Monopolistic Competition? | [4M] |
| | d) What do you mean by Unlimited Liability? | [3M] |
| | e) What do you understand by Ledger? | [4M] |
| | f) What is Net Present Value (NPV)? Explain. | [4M] |

PART -B

- | | | |
|---|--|------|
| 2 | a) Define Managerial Economics and discuss its scope. | [8M] |
| | b) Illustrate the types of Elasticity of Demand. | [8M] |
| 3 | a) Explain the Law of Variable proportions. | [8M] |
| | b) Describe Break-Even Point with the help of diagram and its uses in decision making. | [8M] |
| 4 | a) What is Monopoly? State its features. | [8M] |
| | b) Examine some of the Internet pricing methods used today. | [8M] |
| 5 | a) Examine the merits and demerits of Partnership. | [8M] |
| | b) What do you understand by Business Cycles? What are its causes? | [8M] |
| 6 | a) What is Capital budgeting? What is its significance? | [8M] |
| | b) Discuss Pay Back Period of capital budgeting. | [8M] |



- 7 The following Trial balance was extracted from the books of M/S M.S. Bros. on March 31, 2003. You are required to prepare a Trading account and Profit and Loss account for the year ended March 31, 2003 and a Balance sheet as on that date. The closing stock amounted to Rs. 14,220. [16M]

Particulars	Debit (Rs.)	Credit (Rs.)
Debtors	12,000	
Creditors		7,900
Capital		30,000
Drawings	2,900	
Rent and Rates	250	
Trade expenses	670	
Purchases	8,640	
Sales		14,290
Returns Outwards		280
Returns Inwards	190	
Carriage Inwards	250	
Wages	2,920	
Salaries	1,200	
Stock (April 1 st 2002)	3,100	
Discount received		240
Discount allowed	180	
Bad Debts	200	
Plant and Machinery	2,510	
Furniture and Fittings	1,800	
Cash in hand	500	
Cash at Bank	15,400	
Total:	52,710	52,710



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PART -A

- | | | |
|---|---|------|
| 1 | a) Define Demand, explain the types of Demand. | [3M] |
| | b) What do you mean by Imputed Costs? | [4M] |
| | c) Explain about Perfect Competition. | [4M] |
| | d) Explain about Private Ltd Company. | [3M] |
| | e) Write notes on Trial Balance. | [4M] |
| | f) What is Accounting Rate of Return (ARR)? How it is calculated? | [4M] |

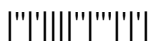
PART -B

- | | | |
|---|--|------|
| 2 | a) Define Demand. What are the determinants of demand? | [8M] |
| | b) Explain the different types of Price elasticity. | [8M] |
| 3 | a) Explain Fixed Costs and Variable Costs with examples. | [8M] |
| | b) Discuss the managerial uses of Break-Even analysis. | [8M] |
| 4 | a) What are the features of Monopolistic competition? | [8M] |
| | b) Explain Transaction based pricing and Priority pricing. | [8M] |
| 5 | a) State the features merits and demerits of Sole Trade. | [8M] |
| | b) What are Business Cycles? | [8M] |
| 6 | a) Explain the importance of Capital budgeting in financial decisions. | [8M] |
| | b) Why are the Traditional methods of capital budgeting still popular? | [8M] |



- 7 From the following Trial balance of Giri Traders, prepare final accounts for the year ended 31-12-2013. [16M]

Particulars	Debit (Rs.)	Credit (Rs.)
Capital		3,00,000
Cash	5,000	
Purchases	19,000	
Purchases returns		500
Sales		20,000
Wages	1,000	
Salaries	800	
Factory Insurance	200	
Rent	650	
Carriage	150	
Office expenses	200	
Carriage outwards	200	
Machinery	8,000	
Furniture	6,000	
Discount allowed	250	
Discount received		1,500
Goodwill	3,550	
Opening Stock	1,500	
Debtors	8,500	
Creditors		3,000
Total:	55,000	55,000



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PART -A

- | | | |
|---|--|------|
| 1 | a) Write a short note on Law of Demand. | [3M] |
| | b) What are Isoquants and Isocosts? | [4M] |
| | c) Write a short note on the features of Oligopoly. | [4M] |
| | d) Explain the concept of Sole Trader and the limitations of sole trading. | [3M] |
| | e) Write a short note on Liquidity Ratio. | [4M] |
| | f) Write a short note on internal Rate of Return (IRR). | [4M] |

PART -B

- | | | |
|---|---|------|
| 2 | a) With the help of a diagram, show the Demand curve and explain why it slopes downwards. | [8M] |
| | b) Explain the quantitative methods used in Demand forecasting. | [8M] |
| 3 | a) Explain the managerial uses of Production function. | [8M] |
| | b) Calculate the BEP in units and rupees using the following details: | [8M] |
| | • Selling price per unit Rs. 100 | |
| | • Variable cost per unit Rs. 60 | |
| | • Fixed costs Rs. 20,000 | |
| | • Actual sales Rs. 2,00,000 | |
| 4 | a) How is price determined under Perfect competition? | [8M] |
| | b) State the conditions in which Market Skimming pricing can be followed. | [8M] |
| 5 | a) Distinguish between Public Ltd Company and Private Ltd Company. | [8M] |
| | b) Discuss the causes of Business Cycles. | [8M] |
| 6 | a) Illustrate Traditional Methods of capital budgeting. | [8M] |
| | b) The cost of a project is Rs. 2, 40,000 and the annual cash inflows for the next five years are Rs. 60,000. What is the Payback period for the project? | [8M] |



- 7 From the following balances, prepare Trading and Profit and Loss Account and Balance Sheet: [16M]

Particulars	Debit (Rs.)	Credit (Rs.)
Machinery	3,500	
Debtors	2,700	
Drawings	900	
Purchases	9,500	
Wages	5,000	
Bank	1,500	
Opening Stock	2,000	
Rent	450	
Sundry expenses	200	
Carriage	150	
Capital		10,000
Creditors		1,400
Sales		14,500

Closing Stock was Rs. 300.



III B. Tech I Semester Regular Examinations, November - 2015
METAL CUTTING & MACHINE TOOLS
(Mechanical Engineering)

Time: 3 hours

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**PART -A**

- 1 a) How is tool life defined? Explain the factors affecting tool life. [4M]
- b) Explain briefly the numerically controlled turret lathes. [4M]
- c) Describe the differences between a planer and a shaper. [4M]
- d) State the advantages of down milling process. [3M]
- e) Differentiate between Honing and Buffing. [4M]
- f) What are the applications of CNC machines? Explain. [3M]

**PART -B**

- 2 a) The power required while turning mild steel rod is found to be 0.1 kw/cm<sup>2</sup>/min. [8M]  
The maximum power available at the machine spindle is 4 KW. Assuming a cutting speed of 38m/min and feed rate 0.32 mm/rev, calculate (i) Maximum metal removal rate, (ii) Depth of cut, (iii) Cutting Force, (iv) Normal pressure on the chip.
- b) Discuss briefly the following tool materials: [8M]  
(i) High speed steels and (ii) Cemented Carbides.
- 3 a) What are the differences between capstan and turret lathe? [8M]
- b) Explain the various types of chucks in detail. [8M]
- 4 a) Calculate the machining time required for making 18 holes on M.S plate of [8M]  
20mm thickness with the data: Drill diameter =30mm, Cutting speed=25m/min and Feed=0.15mm/rev.
- b) Explain briefly the deep hole drilling machine. [8M]
- 5 a) Explain briefly the following with neat sketches: [8M]  
(i) Straddle milling (ii) Dove-tail milling.
- b) Discuss briefly the vertical milling machine. [8M]
- 6 a) Explain briefly the lapping process. Give the examples of lapping work.
- b) Discuss briefly the following: (i) Mounting of wheels (ii) Wheel truing. [10M]
- 7 a) Explain briefly the following with sketches: [10M]  
(a) Clamping screws (b) Quick acting clamps.
- b) Discuss the constructional features of CNC machines. [6M]



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**PART -A**

- |   |                                                                     |      |
|---|---------------------------------------------------------------------|------|
| 1 | a) Explain shear zone with respect to a machining process.          | [4M] |
|   | b) What do you mean by 'Lathe Accessories'?                         | [3M] |
|   | c) How is the size of a planer specified?                           | [3M] |
|   | d) Explain differences between end milling and face milling.        | [4M] |
|   | e) What is the purpose of honing? Give the examples of honing work. | [4M] |
|   | f) Describe briefly "Principle of Location".                        | [4M] |

**PART -B**

- |   |                                                                                                                                                                                            |       |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 2 | Explain the effects of the following parameters on chip formation:<br>(i) Velocity (ii) Material of work piece (iii) Depth of cut (iv) Tool Geometry.                                      | [16M] |
| 3 | a) Discuss the constructional features of speed gear box.                                                                                                                                  | [8M]  |
|   | b) Explain briefly the following operations with neat sketches:<br>(i) Knurling (ii) Forming.                                                                                              | [8M]  |
| 4 | a) Calculate the power required to drill 25mm diameter hole in Al plate at a feed of 0.2mm/rev and at a drill speed 400 rpm. Determine also the volume of metal removed per unit energies. | [8M]  |
|   | b) Explain briefly a Jig boring machine with a neat sketch.                                                                                                                                | [8M]  |
| 5 | a) Describe schematic diagram of universal milling machine.                                                                                                                                | [8M]  |
|   | b) Determine the indexing crank movement for milling square bolt by simple indexing.                                                                                                       | [8M]  |
| 6 | a) Explain the process of precision grinding with a neat sketch.                                                                                                                           | [8M]  |
|   | b) What are the various methods of centreless grinding? Explain.                                                                                                                           | [8M]  |
| 7 | Explain briefly the following fixtures:<br>(a) Grinding fixtures, (b) Milling fixtures, (c) Indexing fixtures                                                                              | [16M] |



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**PART -A**

- |   |                                                                               |      |
|---|-------------------------------------------------------------------------------|------|
| 1 | a) Discuss the methods of chip control.                                       | [4M] |
|   | b) What are the advantages of using a taper turning attachment?               | [3M] |
|   | c) How is metal removal rate in a shaping machine calculated?                 | [3M] |
|   | d) Define the terms 'Indexing' and 'Dividing head'.                           | [4M] |
|   | e) What is the difference between pull broaching and push broaching? Explain. | [4M] |
|   | f) What are the differences between Jigs and Fixtures? Explain.               | [4M] |

**PART -B**

- |   |                                                                                                                                                                                                                                                 |       |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 2 | a) Explain the various types of chips.                                                                                                                                                                                                          | [8M]  |
|   | b) Draw Merchants force diagram. State the assumptions made in the development of such a diagram.                                                                                                                                               | [8M]  |
| 3 | a) Explain briefly the following lathe accessories:<br>(i) Driving Plate (ii) Lathe Centres.                                                                                                                                                    | [8M]  |
|   | b) Explain the different types of tool post with neat sketches.                                                                                                                                                                                 | [8M]  |
| 4 | a) Calculate the machining time required for machining a surface 600mm x 800 mm on a shaping machine. Assume cutting speed as 8m/min. The return to cutting time ratio is 1:4 and feed is 2mm/double stroke. The clearance at each end is 70mm. | [8M]  |
|   | b) Explain briefly "Twist drill nomenclature" with neat sketches.                                                                                                                                                                               | [8M]  |
| 5 | a) Discuss the differential indexing method with a neat sketch.                                                                                                                                                                                 | [8M]  |
|   | b) Explain briefly the following with neat sketches:<br>(i) Form milling (ii) Gang milling.                                                                                                                                                     | [8M]  |
| 6 | a) Differentiate between transverse and plunge grinding.                                                                                                                                                                                        | [8M]  |
|   | b) Describe the working principle of surface grinding.                                                                                                                                                                                          | [8M]  |
| 7 | Explain briefly the following types of Jigs:<br>(i) Universal Jig (ii) Diameter Jig (iii) Channel Jig.                                                                                                                                          | [16M] |



**III B. Tech I Semester Regular Examinations, November - 2015**  
**METAL CUTTING & MACHINE TOOLS**  
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. Answering the question in **Part-A** is compulsory  
3. Answer any **THREE** Questions from **Part-B**

\*\*\*\*\*

**PART -A**

- |   |                                                                    |      |
|---|--------------------------------------------------------------------|------|
| 1 | a) How does the rake angle affect the life of the cutting tool?    | [4M] |
|   | b) Discuss briefly an 'Automatic cut-off machine'.                 | [3M] |
|   | c) Discuss the working principle and operation of a shaper.        | [4M] |
|   | d) Explain Face milling with a neat sketch.                        | [4M] |
|   | e) What is form grinding? Explain.                                 | [3M] |
|   | f) What are the types of motion controls in CNC machines? Explain. | [4M] |

**PART -B**

- |   |                                                                                                                                                                                                                                                                                                                 |       |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 2 | a) In an orthogonal cutting experiment with a tool of rake angle $\alpha=7^\circ$ , the chip thickness was found to be 2.5mm when the uncut chip thickness was set to 1mm.<br>(i) Find the shear angle, $\beta$<br>(ii) Find the friction angle $\gamma$ assuming that merchant's formula holds good            | [8M]  |
|   | b) A carbide-cutting tool lasted for 150 min while machining M.S at 35 m/min. If a similar tool is used at 30% higher speed to machine M.S. Calculate the tool life. Also calculate the value of cutting speed if the tool is to machine for 2 hours. Assume $n=0.3$ in Taylors tool life equation $VT^n = C$ . | [8M]  |
| 3 | a) A shaft 500mm long has a taper of 100mm/m for a distance of 200mm from one end. The maximum diameter of the shaft is 150mm. Determine the amount of set over required.                                                                                                                                       | [8M]  |
|   | b) Calculate the gears for cutting metric threads of the following pitches:<br>(i) 4mm pitch (ii) 5.25mm pitch.<br>The lead screw of the lathe contains 6TPI. The lathe supplied with 20 to 120 teeth in steps of 5 and an additional gear wheel of having 127 teeth.                                           | [8M]  |
| 4 | a) A 40mm HSS drill is used to drill a hole in C.I block 80mm thick. Determine the time required to drill the hole if feed is 0.2mm/rev. Assume an over travel of drill as 5mm. The cutting speed is 22m/min.                                                                                                   | [8M]  |
|   | b) Draw the block diagram of a slotting machine and explain briefly its principal parts.                                                                                                                                                                                                                        | [8M]  |
| 5 | a) What are the types of cutters? Explain.                                                                                                                                                                                                                                                                      | [8M]  |
|   | b) Draw the block diagram of a horizontal milling machine and explain briefly its various parts.                                                                                                                                                                                                                | [8M]  |
| 6 | a) Explain with a neat sketch "Centreless internal grinding".                                                                                                                                                                                                                                                   | [8M]  |
|   | b) What is an abrasive? Explain briefly the following abrasives:<br>(i) Silicon Carbide (ii) Aluminium Oxide.                                                                                                                                                                                                   | [8M]  |
| 7 | Explain briefly the following locating devices:<br>(i) Cylindrical locators (ii) Conical locators (iii) Diamond pin locators.                                                                                                                                                                                   | [16M] |

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Code No: **R31012/R10**

**III B.Tech I Semester Supplementary Examinations, November - 2015**  
**BUILDING PLANNING & DRAWING**  
**(Civil Engineering)**

**Time: 3 hours**

**Max. Marks: 75**

**Answer any THREE Questions from Part – A (3x15M)**  
**and any ONE Question from Part – B (1x30M)**

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**Part – A**

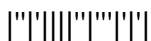
- 1 a) Enumerate the principles laid under the building byelaws.  
b) Explain in detail the criteria for open space requirements.
- 2 a) What are the various climatic factors affecting the Planning of Building.  
b) Discuss the functions purpose and requirements of kitchen and Dining Room.
- 3 Highlight the various concepts to be included in the planning of a hospital.
- 4 a) What are the planning factors that need to be considered for planning of library building? Explain.  
b) Enumerate the basic objectives of Planning and scheduling.
- 5 a) Develop a network based on the following information and determine the critical path and duration of the project.

| Activity               | A  | B  | C | D | E | F   | G  | H   |
|------------------------|----|----|---|---|---|-----|----|-----|
| Immediate Predecessors | -- | -- | A | B | B | C,D | E  | F,G |
| Duration               | 6  | 5  | 9 | 8 | 7 | 13  | 10 | 7   |

- b) State the rules for numbering the network diagram.

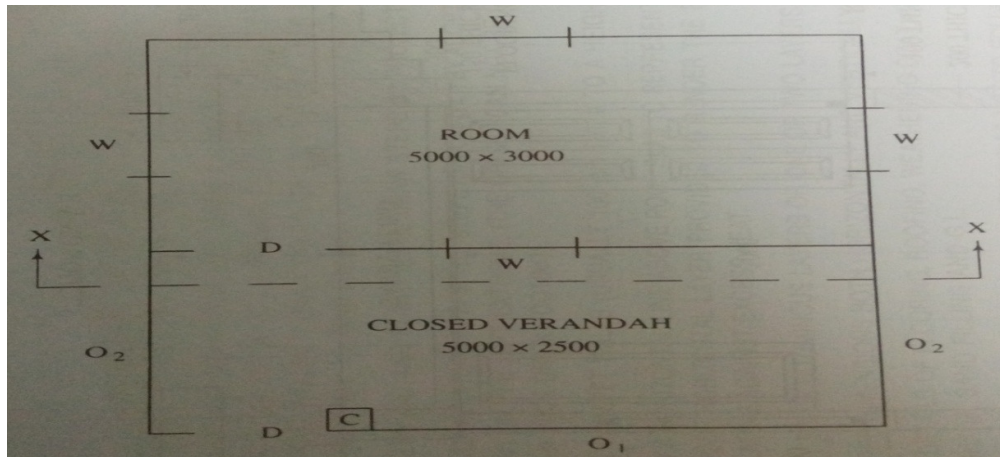
**Part – B**

- 6 a) Show the English bond and Flemish bond for even courses at the junction of a corner.  
b) Draw the conventional sign for Stone, Sand filling, Cast iron and White lead.

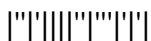


Code No: **R31012/R10**

- 7 The line plan diagram of a building is shown in the figure below. Draw the Plan Section along XX and Elevation. Foundation: All walls are taken 900mm below the ground level. Concrete footings is 300mm thick of 1:3:6 CC, 800mm wide, height of the basement is 600mm above G.L, Walls are 300mm thick of brickwork in C.M 1:6. All walls are of brick 200mm thick in CM 1:6 in superstructure. Clear head room is 3500mm. Roof is 100mm thick 1:2:4 R.C.C slab. Weathering coat of flat tiles of 2 layers, 25mm thick is laid over it. Flooring is 150mm thick C.C of 1:4:8 finished with 10mm thick CM 1:3. Door is paneled door 900mm x 2100mm; Window is of Glazed 1200 x 1400mm. Sunshades project 500mm beyond the wall face.



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Code No: **R31022/R10**

**III B.Tech I Semester Supplementary Examinations, November - 2015**

**ELECTRICAL MEASUREMENTS**

**(Electrical and Electronics Engineering)**

**Time: 3 hours**

**Max. Marks: 75**

**Answer any FIVE Questions**

**All Questions carry equal marks**

**\*\*\*\*\***

- 1 a) Discuss briefly the essential features of indicating instruments. [7]  
b) Derive the equation for deflecting torque of PMMC instrument when it is spring controlled. [8]
- 2 Derive the expressions for ratio and phase angle error of a potential transformer. State the assumptions made for derivation of these errors. [15]
- 3 a) What is phantom loading? Explain with an example how it is more advantageous than testing with direct loading. [7]  
b) Explain the construction and principle of operation of a dynamometer type Wattmeter. How it can be made to read DC as well as AC? [8]
- 4 a) A basic slide wire potentiometer has a working battery voltage of 3 volts with negligible internal resistance. The resistance of slide wire is  $400\Omega$  and its length is 200 cm. A 200 cm scale is placed along the slide wire. The slide wire has 1 mm scale divisions and it is possible to read upto a division. The instrument is standardized with 1.018 V standard cell with sliding contact at the 101.8 cm mark on scale. Calculate: i) Working current, ii) The resistance of series rheostat, iii) The measurement range and iv) The resolution of the instrument. [7]  
b) Explain with the help of suitable diagrams, how a D.C. Potentiometer can be used for: [8]  
i) Calibration of Voltmeter, ii) Calibration of Wattmeter.
- 5 a) Why is Kelvin's double bridge superior to the Wheat-stone bridge for the purpose of low resistance measurement? [4]  
b) How the difficulties associated with the measurement of very high resistance are over come? [4]  
c) Why is the Voltmeter-Ammeter method unsuitable for the precise measurement of the low resistance? [4]  
d) How the effects of contact resistance and resistance of the connecting leads are eliminated in the measurement of resistance by Kelvin's double bridge? [3]
- 6 a) Explain the working of Hay's bridge for measurement of inductance with a circuit diagram. [7]  
b) A capacitor bushing forms arm AB of a Schering bridge and a standard capacitor of 500 pF capacitance and negligible loss, forms arm AD. Arm BC consists of a non-inductive resistance of  $300\Omega$ . When the bridge is balanced arm CD has a resistance of  $72.6\Omega$  in parallel with a capacitance of  $0.148\ \mu\text{F}$ . The supply frequency is 50 Hz. Calculate the capacitance and dielectric loss angle of capacitor. Derive the equations for balance and draw the phasor diagram under conditions of balance. [8]
- 7 a) Discuss any one method of measuring core loss of a magnetic material. [7]  
b) Explain the operating principle of flux meter with a neat sketch. [8]
- 8 Explain the principle of operation of a successive approximation type of Digital voltmeter with a neat block diagram. [15]

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Code No: **R31032/R10**

**III B.Tech I Semester Supplementary Examinations, November - 2015**

**OPERATIONS RESEARCH**

**(Mechanical Engineering)**

**Time: 3 hours**

**Max. Marks: 75**

**Answer any FIVE Questions  
All Questions carry equal marks**

\*\*\*\*\*

- 1 Solve the following LPP using Simplex method : [15M]  
 $Max Z = x_1 + 2x_2$   
 $2x_1 + 3x_2 \geq 6$   
 $x_1 + 2x_2 \leq 8$   
 $x_1, x_2 \geq 0$

- 2 We have five jobs each of which must go through the machines A, B and C in the order ABC. Determine the sequence that will minimize the total elapsed time. [15M]

| Job No | 1 | 2 | 3 | 4 | 5 |
|--------|---|---|---|---|---|
| M/C A  | 5 | 7 | 6 | 9 | 5 |
| M/C B  | 2 | 1 | 4 | 5 | 3 |
| M/C C  | 3 | 7 | 5 | 6 | 7 |

- 3 A stamping machine currently valued at Rs.19,000 is expected to last 2 years and costs Rs.4000 per year to operate. Another machine which can be purchased for Rs.30,000 will last for 4 years and be operated at an annual cost of Rs 3000. If money carries the rate of interest at 10% per annum, determine which stamper, machine should be purchased. [15M]

- 4 Solve the following game: [15M]

|          |   | Player B |   |   |
|----------|---|----------|---|---|
|          |   | 1        | 7 | 2 |
| Player A | 6 | 6        | 2 | 7 |
|          | 5 | 5        | 1 | 6 |

- 5 a) How do you classify the queuing models? Explain. [8M]  
b) In a supermarket, the average arrival rate of customer is 10 every 30 minutes following Poisson process. The average time taken by a cashier to list and calculate the customers purchase is 2.5 minutes following exponential distribution. What is the probability that the queue length exceeds 6? What is the expected time spent by a customer in the system? [7M]





Code No: **R31032/R10**

- 6 Determine a decision rule using the basic purchasing EOQ model for annual demand of 20,000 units, ordering cost of Rs.200 per order and carrying cost of 10% per year. The basic price is Rs.8.00 per unit. This price is in effect of all orders of less than 5000 units. Orders for 5000 or more but less than 10000 units may be purchased for Rs.7.50 per unit. Orders for 10000 or more units may be purchased for Rs.7.25 per unit. [15M]
- 7 Apply Dynamic programming to  $Max Z = 2x_1 + 3x_2$  Subjected to [15M]  
 $x_1 + 2x_2 \leq 4$   
 $x_2 \leq 3$   
 $x_1, x_2 \geq 0$
- 8 a) Write the principal features of simulation languages. [8M]  
b) What are the major limitations of simulation? Explain. [7M]

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Code No: **R31052/R10**

**III B.Tech I Semester Supplementary Examinations, November - 2015**

**COMPUTER NETWORKS**

**(Common to CSE and IT)**

**Time: 3 hours**

**Max. Marks: 75**

**Answer any FIVE Questions  
All Questions carry equal marks**

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- 1 a) What are the different addresses used by devices of computer network? [7]  
b) What are the various protocols of TCP/IP protocol stack? [8]
- 2 a) How circuit switching is different from packet switching? [8]  
b) What is the role of a physical layer? What are the different accesses methods using which internet services are accessed? [7]
- 3 a) What are the relative merits and demerits of Error detection and Error correction? [8]  
b) What services are provided by data link layer to network layer? [7]
- 4 a) How point-to-point protocol works? [8]  
b) What types of errors are handled by Selective Repeat protocol? [7]
- 5 a) What are the relative merits and demerits of CDMA, FDMA and TDMA? [8]  
b) What is polling? What are the assumptions related to it. What are the pros and cons? [7]
- 6 a) What is the frame structure of IEEE 802.11? [8]  
b) How are collisions avoided in Ethernet? [7]
- 7 a) How is LEO satellite used for transmission? [7]  
b) What are the different layers of Bluetooth? Explain their functionality. [8]
- 8 a) What is spanning tree? How loops are avoided using spanning tree bridges? What are the advantages and disadvantages of using spanning tree bridges? [8]  
b) How switching is different from routing at network layer? [7]

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