**Code No. 3207**

# FACULTY OF ENGINEERING

## B.E. 4/4 (Civil) I-Semester (Suppl.) Examination, May 2017

**Subject : Structural Engineering Design and Detailing-II (Steel)**

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

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

**PART – A** (25 Marks)

| | | |
|---|---|---|
| 1 | Explain about rational splice, moment splice and shear splice. | 3 |
| 2 | Write the design criteria for intermediate vertical stiffners. | 3 |
| 3 | Compare the physical parameters of plate girder and a rolled beam. | 3 |
| 4 | Draw the section of a typical gantry girder. Why channel section is used in the girder? | 3 |
| 5 | State the forces acting on a gantry girder. What are their magnitudes for EOT and MOT cranes. | 3 |
| 6 | Explain any two types of bearings used in bridges. | 2 |
| 7 | Explain about flange curtailment with sketch. | 2 |
| 8 | Explain any two formulae used for calculating self weight of truss girder. | 2 |
| 9 | Explain about over turning effect in deck type railway girder. | 2 |
| 10 | How do you decide the dimensions of a plate girder? | 2 |

**PART – B** (50 Marks)

11 Design a welded plate girder for an effective span of 22m. It carries a factored uld of 45 kN including self weight. Design for flexure and check for shear. Curtail the flange plates. Draw neat sketches showing cross section and longitudinal section. Adopt Fe410 grade steel, use limit state design. 15

**OR**

12 A welded plate girder consists of web 1600 x 20mm and flange 400 x 30 mm. The girder carries a factored load of 50 kN/m on an effective span of 24m. Design

i) Suitable welded connection between the flange and the web, permissible stress in weld = 110N/mm$^2$

ii) Intermediate transverse (vertical) stiffner. 15

13 Design a simply supported gantry girder to carry vertical and horizontal loads for EOT crane. Span of gantry girder 7.0m, Span of crane girder = 20m, Self weight of crane with trolly = 200 kN, Crane capacity = 250 kN , Wheel base = 3.2m, Minimum hook approach = 1m, Self weight of rails 6kN/m. Adopt Fe410 grade steel, use limit state method. 15

**OR**

14 Design a rocker bearing for a bridge girder for the following data. Gravity load including live load, dead load and impact load = 1200 kN. Vertical load due to wind = 300 kN, lateral load due to wind on the pin = 75kN. Allowable bearing stress in concrete = 8.5 N/mm$^2$. 15

15 Design a plate girder for deck type railway bridge for broad guage main line loading effective span of the bridge is 22m. Take EUDL for bending moment = 2123 kN per track and for shear force = 2337 kN per track. Also design the intermediate transverse (vertical) stiffners. Draw neat sketches showing design details. 20

**OR**

16 Design bottom chord member for a through type railway bridge of effective span 25m with 5 panels. Take EUDL for BM = 2356 kN per track and EUDL for shear = 2586 kN per track. The truss is pratt type with a height of 6m. Draw neat sketch of the member designed. 20

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Code No. 3218

# FACULTY OF ENGINEERING

**B.E. 4/4 (EEE) I – Semester (Supplementary) Examination, May 2017**

**Subject : Power System Operation and Control**

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

***Note: Answer all questions from Part–A. Answer any FIVE questions from Part–B.***

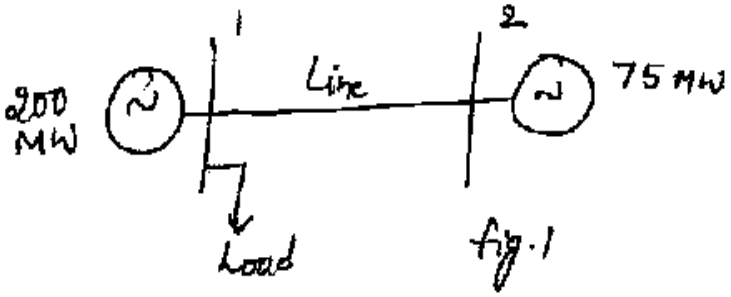
**PART – A** (25 Marks)

1 Explain why load flow studies are performed.
2 Explain why two variables are specified at each bus in load flow studies.
3 What is penalty factor in economic scheduling? Explain its significance.
4 List out the assumptions made in deriving transmission loss coefficients.
5 What is flat frequency control?
6 Explain the simplified functional diagram of the primary ALFC loop.
7 What is swing curve?
8 Explain the advantages of pool operation.
9 Explain reasons for variations of voltage in power systems.
10 Give the classification of FACTS controllers.

**PART – B** (50 Marks)

11 Explain the N-R method of load flow solution with Rectangular coordinates.

12 a) Consider the two-bus system shown in fig-1




It is observed that when a power of 75 MW is imported to bus 1, the loss amounted to 5 MW. Find the generation needed from each plant and also the power received by the load, if the $\lambda$ is Rs 20/MWh. The incremental fuel cost at the two planks are given by

$$\frac{dc_1}{dp_1} = 0.03\,P_1 + 15\ \text{Rs/MWh}$$

$$\frac{dc_2}{dp_2} = 0.05\,P_2 + 18\ \text{Rs/MWh}$$

b) The fuel input characteristics for two thermal plants are given by

$$F_1 = (8P_1 + 0.024P_1^2 + 80)10^6\ Kcal/hr$$

$$F_2 = (6P_2 + 0.004P_2^2 + 120)10^6\ Kcal/hr$$

i) Plot the input-out characteristic for each plant
ii) Plot the heat-rate characteristic for each plant

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13 Obtain the stake space model of single area LFC system.

14 a) Explain about equal area criterion of stability.
b) Explain the methods of improving transient stability.

15 What is Automatic voltage regular. Explain its types. Also explain the principle of operation of AVR.

16 A 500 MW generator is operating at a load of 20 MW. A load change of 1%. Causes the frequency to change by 1%. If the system frequency is 50 Hz determine the value of load damping factor in p.u.

17 Write short notes on :
i) UPFC
ii) Voltage stability

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Code No. 3229

# FACULTY OF ENGINEERING

## B.E. 4/4 (Inst.) I – Semester (Suppl.) Examination, May 2017

## Subject: Analytical Instrumentation

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

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

### PART – A (25 Marks)

1 Explain various regions of electromagnetic radiation. [3]

2 Define electrochemical cell. [2]

3 What is the difference between calorimeter and spectrophotometer? [3]

4 Define molar extinction coefficient. [2]

5 Enlist any four applications of Mass spectrometer. [2]

6 Define $P^H$. [2]

7 What is the principle of absorption instruments? [3]

8 Why high vacuum is essential for mass spectrometer? [3]

9 How CO in air is estimated using IR gas analyzers? [2]

10 What are the various detectors used in GC? [3]

### PART – B (5x10=50 Marks)

11 a) Explain magnetic wind instrument. [5]

b) Discuss about the selective ion electrode. [5]

12 Explain in detail about the gas chromatograph. [10]

13 Describe any two gas analyzers used to analyze oxygen. [10]

14 a) With the help of the mathematical equation, explain Beer Lambert's law. [7]

b) What are the limitations of Beer Lambert's law? [3]

15 Explain double beam spectrophotometer. [10]

16 Discuss electrodes for $P^H$ measurement. [10]

17 Write a short note on any two. [10]

a) NMR.
b) Absorption instruments.
c) Sample handling techniques.

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**Code No. 3233**

# FACULTY OF ENGINEERING

## B.E. 4/4 (ECE) I - Semester (Suppl.) Examination, May 2017

**Subject : Microwave Engineering**

**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 Define TE, TM and TEM modes of wave propagation. (3)
2 A 10GHz signal is to be propagated through a rectangular waveguide. Calculate the dimensions of waveguide and guide wavelength for dominant mode of propagation. (3)
3 Define ferrite phase shifter. (2)
4 What do you understand by unloaded and loaded quality factor of a resonator? (2)
5 Calculate the coupling factor if the power is primary waveguide is 72m W and power delivered to directional couples is 8m W. (3)
6 Differentiate reciprocal and non reciprocal devices. (2)
7 Mention properties of S parameters. (3)
8 What is Gunn effect? (2)
9 How is tuning achieved in reflex klystron? (3)
10 Write the characteristics of slot lines. (2)

### PART – B (50 Marks)

11 Explain TM propagation is parallel plate waveguide. Calculate time averaged poynting vector and wave impedance. (10)

12 What are $TE_{nm}$ and $TM_{nm}$ modes with reference to a circular waveguide? Sketch the dominant modes and obtain the relations for these dominant modes. (10)

13 (a) Mention the properties of Magic Tee. (4)
(b) Derive the S-matrix of Magic Tee. (6)

14 (a) What is Apple gate diagram? What is its importance? (4)
(b) Derive the relation between repeller voltage ($V_r$) and Anode voltage ($V_o$) in reflex klystron. (6)

15 (a) Differentiate between linear and cross field devices. (4)
(b) Drive the expression for cut-off \ magnetic flux density with reference to cylindrical cavity magnetron. (6)

16 (a) What are avalanche transit time devices? (4)
(b) Explain the operation of IMPATT. (6)

17 Write notes on the following:
(a) Modes of operation in Gunn diode (5)
(b) Modes of operation in Reflex klystron (5)

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Code No. 3255

# FACULTY OF ENGINEERING

**B.E. 4/4 (Prod.) I – Semester (Suppl.) Examination, May 2017**

**Subject: Production Drawing Practice**

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

**Note: Answer all questions from Part A and Part B.**

## PART – A (25 Marks)

1 What are the different sizes of drawing sheets? Give their designations and sizes.
2 Define fit. What are the different types of fits?
3 Explain the following symbol shown in Fig. 1.

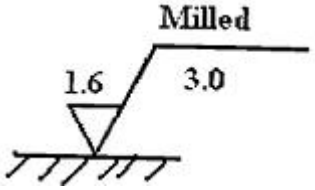


**Fig. 1**

4 Expand the following abbreviations:
a) CHD b) BRC c) HTS
5 Find the limits of the following shafts and holes.
40h6, 50p9, 30H6, 70H11.
6 Indicate the recommended tolerance grades for the following manufacturing processes.
a) Lapping b) Grinding c) Reaming
7 Indicate roughness values and roughness symbols for grades N10 and N1.
8 Give the conventional representations of a bevel gear.
9 What are the uses of geometric tolerances?
10 Name the fit between piston and cylinder; housing and handle screw.

## PART – B (50 Marks)

11 From the assembly drawing of petrol engine connecting rod, shown in Fig. 2. Answer the following:

a) Give the fits for the following Alpha numeric values of resulting tolerances.
1) Connecting rod and small end bush
2) Bearing brasses and connecting rod

b) Draw the following component drawings and give necessary dimensional and geometric tolerances, surface roughness values and surface treatments.

1) Connecting rod
2) Big end cap
3) Bearing brasses
4) Small end bush
5) Big end bolts

c) Give the process sheet for the component connecting rod.

Part list

| Item No. | Part Name | Material | Qty. |
|---|---|---|---|
| 1 | Connecting rod | Forged steel | 1 |
| 2 | Big end cap | Forged steel | 1 |
| 3 | Bearing brasses | Gun metal | 2 |
| 4 | Small end bush | Gun metal | 1 |
| 5 | Big end bolts | Medium carbon steel | 2 |
| 6 | Nuts | Medium carbon steel | 2 |

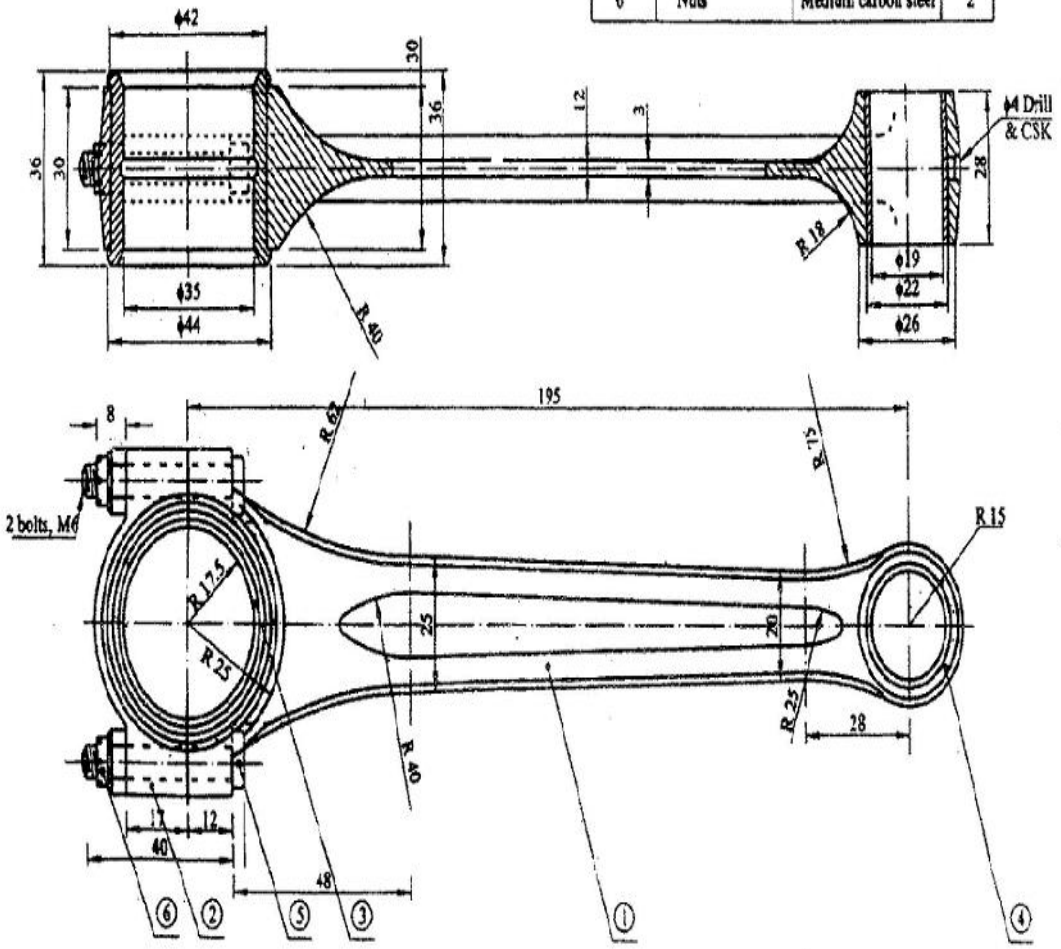


**Fig. 2**

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**Code No. 3280**

# FACULTY OF INFORMATICS

## B.E. 4/4 (IT) I - Semester (Suppl.) Examination, May 2017

**Subject : Middleware Technologies**

**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 | What are the characteristics of Client / Server computing? | (2) |
| 2 | Define Middleware. List out the different types of middleware. | (3) |
| 3 | Differentiate between Generic Servlet and HttpServlet. | (3) |
| 4 | What are the basic components of struts? | (3) |
| 5 | What is the difference between javabeans and EJB? | (2) |
| 6 | What are the services provided by the EJB container? | (3) |
| 7 | What does IIOP stand for and what is its significance? | (2) |
| 8 | Define CORBA. What is meant by ORB? | (2) |
| 9 | List out the different COM data types. | (3) |
| 10 | Define marshaling and unmarshaling. | (2) |

### PART – B (50 Marks)

| | | |
|---|---|---|
| 11 | (a) Explain in detail about SOAP and WSDL. | (6) |
| | (b) How is RPC implemented in client server environment? Explain with a neat sketch. | (4) |
| 12 | (a) Explain the concept of Servlets with an example program. | (5) |
| | (b) Explain MVC architecture with a neat sketch. | (5) |
| 13 | (a) Discuss briefly about entity bean life cycle methods. | (5) |
| | (b) Explain in different roles in EJB. | (5) |
| 14 | (a) Explain about the CORBA architecture with a neat diagram. | (5) |
| | (b) Discuss in detail about the various CORBA Services. | (5) |
| 15 | (a) What are the major Components (Layers) of the .NET framework? Explain in detail. | (6) |
| | (b) Explain about component object model (COM). | (4) |
| 16 | (a) Write short notes on REST Services. | (5) |
| | (b) What are the life cycle methods of Servlet? Explain. | (5) |
| 17 | Write short notes on the following: | |
| | (a) Building and deploying EJB | (4) |
| | (b) IDL | (3) |
| | (c) Remoting | (3) |

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