

## FACULTY OF ENGINEERING

BE (Civil) IV-Semester (CBCS) (Main) EXAMINATION, May /June 2018

Subject: Strength of Materials - II

Time: 3 Hours

Max. Marks: 75

Note: Answer All Questions From Part –A, &amp; any FIVE Questions From Part-B

**PART-A (25 Marks)**

1. What is an elastic curve? 2
2. Write the limitations of double integration method 2
3. Find the static indeterminacy of propped cantilever beam 2
4. Draw a B.M. diagram for a fixed beam of span L and carrying a point load W at mid-span 2
5. Define the Torsional rigidity for a shaft. 2
6. List the various types of springs 2
7. State the Maxwell's reciprocal theorem 2
8. Differentiate between gradually applied load and suddenly applied load. 2
9. Write an expression for area and moment of inertia of an analogous column to fixed beam of span L and flexural rigidity EI. 2
10. State Rankine's hypothesis for a column 2

**PART-B (50 Marks)**

11. A cantilever beam of span L is Subjected to a uniformly distributed load of W from free end to mid-span. Determine the expression for rotation and deflection at the free end of the beam using moment area method 10
12. A beam ABCD, 20 m long is continuous over three spans AB=7m, BC=5m and CD=8m, the supports being at the same level. There is a uniformly distributed load of 15 kN/m over AB. On BC, there is a point load of 60 kN at 2m from B. On CD, there is a point load of 40 kN at 4m from C. Find the moments and reactions at the supports and hence plot the S.A.F and B.M diagrams. 10
- 13 Write the assumptions of theory of pure torsion and derive the simple torsion equation for circular shaft. 10
- 14 A close coiled spring has mean diameter of 80 mm and spring constant of 100 kN/m. It has 9 coils. Modulus of rigidity of the spring wire material is 85 GN/m<sup>2</sup>. Determine the suitable diameter of the spring wire if maximum shear stress is not to exceed 240 MN/m<sup>2</sup>. Also determine the maximum axial load the spring can carry. 10
- 15 A simply supported beam AB of span 12m is loaded with 40 kN at mid-span and uniformly distributed load of 6.5 kN/m over the whole span Using castigliano's first theorem, determine the central deflection and rotation at the ends of the beam. Take EI=10,000 kN/m<sup>2</sup>. 10

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- 16 A 3 m long pin ended column of square cross-section is to be made of RCC. Assuming  $E=25$  GPa and allowable stress being limited to 25 MPa, determine the size of the column to support 200 kN load safely. Use factor of safety of 2 and Euler's crippling load for buckling. What will be the size of the column if only end conditions being changed to hinge? 10
- 17 A simply supported beam AB of span 7m is loaded with a point load of 30 kN at C, 3 m from end A. The beam has moment of inertia  $4I$  for the length AC and  $I$  for the length CB. Using conjugate beam method. Determine slope at end A, deflection at C, deflection at mid-span and maximum deflection. Take  $I=45,000$  cm<sup>4</sup> and  $E=20$  GPa. 10

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**FACULTY OF ENGINEERING**

B.E IV Semester (CBCS) (EE/Inst.) Main Examination, May / June -2018

Subject: Power Electronics

Time: 3 hours

Max. Marks: 70

Note: Answer all questions from Part-A & Answer any five questions from Part-B  
**PART-A (20 Marks)**

- 1 Define the following terms for diodes:
  - i) Reverse recovery time
  - ii) Reverse recovery current
- 2 For a power diode, the reverse recovery time is  $3.9\mu\text{s}$  and the rate of diode current decay is  $50\text{A}/\mu\text{s}$ . For a softness factor of 0.3, calculate the peak inverse current and storage charge.
- 3 Why pulse triggering is preferred for firing SCRs?
- 4 List, the different types of forced commutation techniques employed for thyristors.
- 5 A resistive load of  $10\ \Omega$  is connected through a half-wave SCR circuit to  $220\text{V}$ ,  $50\text{Hz}$ , single phase source. Calculate the power delivered to load for a firing angle of  $60^\circ$ .
- 6 A single phase full converter delivers power to a resistive load  $R$ . For ac source voltage  $V_s$ , show that the average output voltage  $V_0$  is given by  $= \frac{\sqrt{2}V_s}{\pi}(1 + \cos\alpha)$
- 7 For type-A chopper, dc source voltage is  $230\text{V}$ , load resistance is  $10\ \Omega$  and takes a voltage drop of  $2\text{V}$  across chopper when it is on. For a duty cycle of 0.4, calculate rms value of output voltage.
- 8 What do you mean by integral cycle control?
- 9 List few industrial applications of inverters.
- 10 What is the purpose of connecting diodes in antiparallel with switches in inverter circuits?

**PART-B (50 Marks)**

- 11 a) Explain the switching performance of BJT with relevant waveforms. Indicate clearly turn-on and turn-off times and their components. 5+5  
 b) Draw and explain the switching characteristics of a thyristor.
- 12 a) Following are the specifications of a thyristor operating from a peak supply of  $500\text{V}$ : Repetitive peak current,  $I_p=250\text{A}$ ,  $\left. \begin{matrix} \text{max} \\ \text{max} \end{matrix} \right) =60\text{A}/\mu\text{s}$ ,  $\left. \begin{matrix} \text{max} \\ \text{max} \end{matrix} \right) =200\text{V}/\mu\text{s}$ . Take a factor of safety of 2. Design a suitable snubber circuit if the minimum load resistance is  $20\ \Omega$ . Take  $\cos\phi =0.65$ .  
 b) Explain with relevant circuit diagram and waveforms how resonant pulse commutation is achieved?
- 13 a) A 3-phase full converter charges a battery from a three-phase supply of  $230\text{V}$ ,  $50\text{Hz}$ . The battery emf is  $200\text{V}$  and its internal resistance is  $0.5\ \Omega$ . On account of inductance connected in series with the battery, charging current is constant at  $20\text{A}$ . Compute the firing angle delay and the supply power factor.

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- b) Describe the operation of a single phase two-pulse mid-point converter with relevant voltage and current waveforms and obtain an expression for the output voltage.
- 14 a) Explain with a neat circuit diagram how four quadrant operation is obtained for a dc-dc converter?  
b) Describe the operating principle of 1-phase to 1-phase step-down cycloconverter with the help of mid-point configuration. 5+5
- 15 A single phase bridge inverter feeds power to a load of  $R=12$  and  $L=0.04H$  from a 400V dc source. If the inverter operates at a frequency of 50Hz, determine the power delivered to load for  
a) square wave operation  
b) quasi-square wave operation with an on-period of 0.6 of a cycle  
c) two symmetrically spaced pulse per half cycle with an on-period of 0.6 of a cycle.
- 16 a) Describe the working of single-phase full converter in the inverter mode with RLE load.  
b) A step up chopper has input voltage of 220V and output voltage of 660V. If the non-conducting time of thyristor chopper is  $100\mu s$ , compute the pulse width of output voltage. In case pulse width is halved for constant frequency operation, find the new output voltage. 5+5
- 17 Explain any two from the following  
a) Multi Level Inverters  
b) Describe the principle of burst firing control for a single phase ac voltage controller. 5+5  
c)  $120^\circ$  mode of operation for 3-phase inverters.

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**FACULTY OF ENGINEERING****B.E. (ECE) IV – Semester (CBCS) (Main) Examination, May / June 2018****Subject: Analog Electronic Circuits****Time: 3 Hours****Max.Marks: 70****Note: Answer all questions from Part – A and any five questions from Part – B.****PART – A (20 Marks)**

- 1 Classify amplifiers based on type of coupling between stages and operating frequency range. (2)
- 2 Three stages are connected in cascade with gain of one stage is 50 and upper cutoff frequency is 100Khz. Find overall gain and upper cutoff frequency. (2)
- 3 What is the effect of voltage shunt negative feedback on  $R_i$  and  $R_o$  of amplifier? (2)
- 4 Compare local and global feedbacks. (2)
- 5 What is cross-over distortion in power amplifiers-explain? (2)
- 6 What are the advantages of transformer coupled push-pull power amplifier? (2)
- 7 Write about stability of oscillators. (2)
- 8 Compare RC and LC oscillators. (2)
- 9 What is uni-lateralisation in RF voltage amplifier? (2)
- 10 What is staggering in multistage amplifier? What is the achievement with staggering? (2)

**PART – B (50 Marks)**

- 11 For a single stage RC coupled BJT amplifier derive expressions for midband gain, lower cutoff frequency and upper cutoff frequency. (10)
- 12 a) An amplifier with open loop voltage gain  $A_v=1000\pm 100$  is available. It is desired to have an amplifier whose gain varies by not more than  $\pm 0.1\%$ . Find feedback factor beta and gain with feedback. (5)  
b) Write about stability of feedback amplifiers? What is gain margin and phase margin? (5)
- 13 Draw the circuit of RC phase shift oscillator using BJT and explain operation. Derive expressions for condition of oscillation and frequency of oscillations. (10)
- 14 a) Prove that efficiency of class-A power amplifier is 50%. (5)  
b) What is class-D operation –explain with a circuit and give its applications? (5)
- 15 For a single tuned RF voltage amplifier obtain expressions for gain at resonance and bandwidth. (10)

- 16 a) Given  $I_c=5\text{ma}$ ,  $V_{ce}=10\text{v}$  at room temperature  $h_{fe}=100$  ,  $h_{ie} =600$  ohms,  $h_{re}=0.0001$ ,  $h_{oe}=0.00004$  mhos. Compute the values of pi-parameters. (5)
- b) .Prove that bandwidth increases with negative feedback. (5)
- 17 Write short notes on two of the following: (10)
- Transistorized shunt regulator.
  - Complimentary symmentry power amplifier.
  - Double tuned RF voltage amplifiers.

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## FACULTY OF ENGINEERING

B.E. IV-Semester (CBCS) (M/P) Examination, May / June 2018

PAPER: Electrical Circuits & Machines

Time:3 Hours

Max Marks :70

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

### Part-A (20 Marks)

1. State and explain Kirchhoff's law. (2)
2. Explain about
  - (i) Ideal Voltage Source
  - (ii) Ideal Current Source (2)
3. Write a brief note on star- connected system. (2)
4. Explain the principle of auto-transformer. (2)
5. Write a short note on types of Generator. (2)
6. Why above rated speed is obtained in field control method? (2)
7. Explain the principle of operation of 3-phase induction motor. (2)
8. What is meant by the slip of an Induction Motor. (2)
9. Define the terms (a) Synchronous speed (b) Regulation (2)
10. Why single phase induction motor is not self starting. (2)

### Part-B (50 Marks)

11. a) Three resistors are connected in series across a 12V battery. The first resistor has the value of 1 ohm, second has a voltage drop of 4V and third has a power dissipation of 12W. Calculate the value of each resistance and circuit current. (5)
  - b) Two resistances one of 30 ohms and another of unknown values are connected in parallel, the total power dissipated in the circuit is 450 watts when the applied voltage is 90 volts. Find the value of unknown resistance. (5)
12. Derive the expression for Current, Phase-angle, Power factor and power for R-L series circuit. (10)
13. a) Explain 3-phase power measurement by using Two- wattmeter method. (7)
  - b) Two wattmeter method is used to measure the power absorbed by a 3-phase induction motor. The wattmeter readings are 12.5KW and -- 4.8KW. find i) The power absorbed by the machine, ii) Load power factor, and iii) Reactive Power taken by the load. (3)
14. a) Derive the relation to find condition for Maximum Efficiency. (5)
  - b) In a 50 KVA Transformer, the iron Loss is 500 W and full load copper loss is 800 W. find the efficiency at full load and half load at 0.8 p.f lag. (5)

15. a) Derive the emf equation of DC generator. (5)
- b) The armature of an 8-pole DC generator has wave winding containing 664 conductors. Calculate the generated emf when the flux per pole is 0.08 wb and speed is 210 r.p.m. At what speed should the armature be driven to generate 500V if the flux per pole is made 0.06 wb. (5)
16. a) Why 3-phase Induction motor is self-starting. (5)
- b) Explain the construction of 3-Phase Induction motor. (5)
17. a) Derive EMF equation of Alternator. (5)
- b) Discuss the construction of 3-phase alternator. (5)

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**FACULTY OF ENGINEERING****B.E. IV Sem. (CBCS) (A.E.) (Main) Examination, May / June 2018****Subject : Automotive Petrol Engines.****Time : 3 Hours****Max. Marks: 70****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (20 Marks)**

1. What is the necessity of firing order in a Multi cylinder engines.
2. Why Scavenging is important in 2 stroke engines compared to four Stroke engine.
3. What are the different air fuel mixtures on which an engine can operate ?
4. What are the draw backs of Simple carburetors ?
5. Write down the components of ignition system used in automobiles.
6. Define dwell angle and mention its importance ?
7. How is location of the spark plug can influence knocking tendency ?
8. Define flame front propagation.
9. What are the important qualities of good lubricant used in an automobile.
10. Write the reasons for cooling an engine.

**PART-'B'(50 Marks)**

11.
  - a) With a neat sketch explain the working of 4 stroke engine.
  - b) Explain, why valve timings of 4-stroke engine has to be varied from theoretical diagram value.
12.
  - a) Draw the sketch of a down draught carburetor. How do the idle and low Speed circuits work in the carburetor.
  - b) Differentiate between constant choke and constant vacuum carburetors.
13.
  - a) With a neat sketch explain the working principle of Battery ignition system.
  - b) With a neat sketch explain working of spark plug.
14.
  - a) Explain the phenomena of knock in S-I Engine.
  - b) What are the factors to be considered while designing a combustion chamber ?
15.
  - a) With a neat sketch explain the working principle of thermosyphon cooling System.
  - b) Differentiate between wet sump and dry sump lubrication systems.
16.
  - a) Derive an expression for air standard efficiency of Otto Cycle.
  - b) What are the advantages of petrol injection system ?
17. Write a short notes on any three of the following.
  - a) Electronic ignition system.
  - b) Stages of combustion in S.I. engines.
  - c) Pressure Cooling System.
  - d) MPFI.

**FACULTY OF ENGINEERING**  
**BE IV - Semester (CBCS)(CSE) (Main) Examination, MAY /June 2018**

**Subject : Signals & System Analysis**

**Time: 3 Hours**

**Max Marks: 70**

**Note:** Answer all questions from Part-A & Any five questions From Part-B.

**Part - A (20 Marks)**

1. What is Signum function?
2. What is Hilbert Transform?
3. Determine the signals  $\cos nt$  and  $\sin nt$  are orthogonal over 0 to
4. Find the Fourier transform of  $f(t) = \cos w_c t$ .
5. What is LTI system?
6. Check whether the system  $y(t) = n.x(t)$  is Time Invariant or not?
7. What is Correlation?
8. Find the Convolution of  $x(n) = \{1, 2, 3,4\}$  and  $y(n) = \{2,3,4,5\}$  using non – graphical method.
9. Differentiate Laplace transform and Z- transform.
10. Find the Z-transform of  $x(n) = \{1, -2,4,5\}$ .

**PART – B (50 Marks)**

11. a) Explain the completeness of orthogonal function 5  
 b) Approximate the function  $f(t)=1; 0$  to  $f$  with  $\sin nt$  over 0 to  $2f$  in such away that its MSE is min -1;  $f$  to  $2f$  . Also find Mean Squared Error. 5
12. a) State and prove any four properties of Fourier transform 5  
 b) Find the Fourier transform of  $f(t) \sin w_c t$  and plot its spectrum 5
13. a) Check whether the system  $y(t)=x(t^2)$  is liner or not and Time Invariant or not 5  
 b) Explain poly – Weiner criterion for physical realization 5
14. a) Perform convolution operation using graphical method for  $x(n)=\{2,-1,4,3\}$  and  $h(n) = \{1,2,-3,5\}$ . 5  
 b) Define cross correlation. State and Prove any two properties 5
15. a) Find the Z–Transform for  $x(n)=(1/4)^n u(n)+(1/5)^n u(n)$  and plot its pole – zero locations 5  
 b) Determine the inverse Z-tranform for  $X(Z)=(z+4)(z-1)/(z+1)(z+2)^2$  : ROC :  $|z| > 2$  5
16. a) Explain Causal system with example. 5  
 b) State and prove any three properties of Hilbert transform. 5
17. a) Differentiate energy density spectrum and power density spectrum 3  
 b) Differentiate convolution and correlation? 4  
 c) Write notes on distortion less transmission through a system 3

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**FACULTY OF INFORMATICS****B.E. IV Sem. (CBCS) (I.T) (Main) Examination, May / June 2018****Subject : Computer Organization & Microprocessor.****Time : 3 Hours****Max. Marks: 70****Note: Answer all questions from Part-A & any five questions from Part-B.****PART A(20 Marks)**

1. Write about memory hierarchy
2. What is the purpose of TLB?
3. Discuss virtual memory
4. Compute the effective memory access time, where cache access time takes 4 ns, while main memory access time is 50 ns with 80% hit ratio.
5. Write about interrupts in detail
6. Explain instruction i. DAA ii. CMA
7. Write about subroutine
8. Explain Parallel bus standard of RS232 C
9. Write about ADC
10. Define memory mapped I/O.

**PART B(50 Marks)**

- |  |    |
|--|----|
| 11. a. Describe types of computers?  | 7  |
| b. How is performance measured in computer system?   | 3  |
| 12. a. Explain types of RAMS in detail?  | 8  |
| b. Write short notes on virtual memory.  | 2  |
| 13. Explain Architecture of 8085 microprocessor in detail.   | 10 |
| 14. Explain working of DMA Controller (Intel 8257) in detail.  | 10 |
| 15. Explain working of 8255 PPI in I/O mode in detail.   | 10 |
| 16. Write Assembly language program to perform multiplication of two 8-bit numbers whose result is 16bit using 8085 instruction set. | 10 |
| 17. Discuss working of keyboard /Display controller (Intel 8279) in detail.  | 10 |

## FACULTY OF ENGINEERING

B.E. 4/4 (Civil) I-Semester (Old) Examination, May/June 2018

Subject : Estimating and Specifications

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 are the qualities of good estimator?
- 2 Write the specifications For cement concrete 1:2:4
- 3 How specifications affect the cost of constructions? Explain
- 4 What is meant by analysis of rates? Why it is done?
- 5 Calculate the quantity of materials for 100m<sup>2</sup> cement concrete 1:2:4
- 6 What is the difference between scheduled rates and tendered rates?
- 7 How do you calculate the earthwork of a unlined canal?
- 8 How can a contract be terminated or discharged?
- 9 Prepare a preliminary estimate for a building given the total plinth area 1500 sqm, plinth rate Rs. 1200/sqm, extra for architechical treatment 1.5% of building cost, extra water supply 5%, extra for internal installations 14%, extra for services 6%, contingencies 3%.
- 10 Mention the deductions which are to be neglected in case of concrete works

### PART-B (50 Marks)

1. Prepare a detailed estimate of the following items of a two roomed building with verandals from the given figure 1

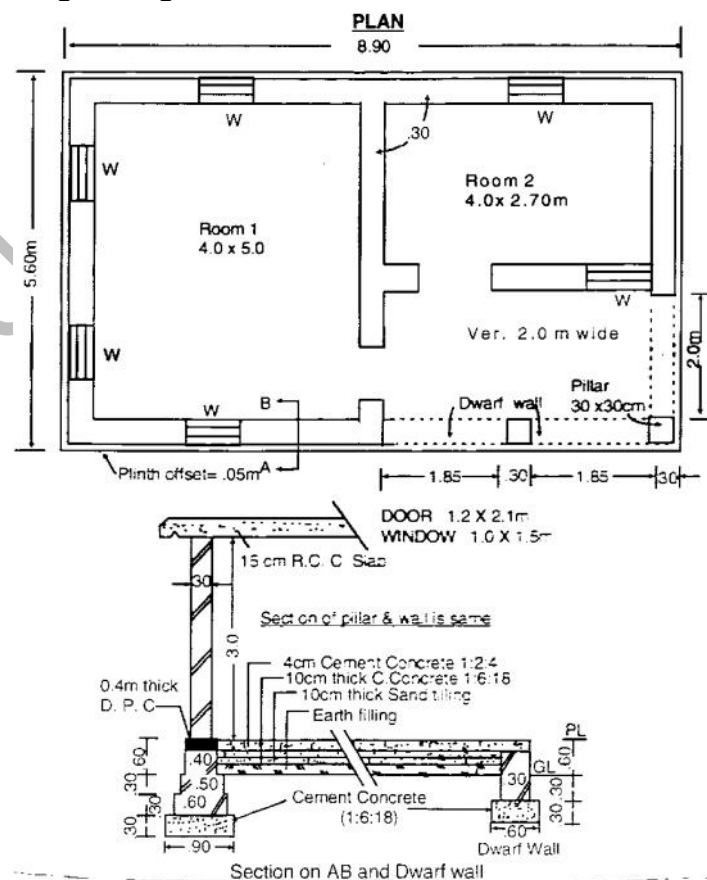


Figure 1

- a) Earth work in excavation in foundation
- b) Lime concrete in foundation
- c) I – class brickwork in superstructure

12. a. Explain the factors affecting analysis of rates.

b. Calculate the material requirement for  $200\text{m}^3$  of lean concrete 1:8:16

13. Reduced levels of ground along the centre line of a proposed road from change 10 to 20 are given below. The formation level at the 10<sup>th</sup> is 100 and the road is in upward gradient of 1 in 90 up to 15 and gradient changes to 1 in 110 downward. Formation width of the road is 10m and side slope in banking 2:1 length of the chain is 20m. prepare an estimate of earthwork

Change	10	11	12	13	14	15	16	17	18	19	20
RL of ground	99.20	99.60	99.80	100.30	100.60	99.40	99.20	98.30	99.40	98.90	98.90

14. a. What are different types of estimates? Which type can give us the exact cost?

b. Discuss the long wall/short wall method for taking out quantities

15. a. Explain briefly the different types of contracts

b. Explain the departmental procedure for construction work

16. a. Define conditions of contract and mention their objectives and importance.

b. Explain the objectives of making provisions for earnest money and security deposit

17. a. What are the essential principles of good specification writing?

b. Explain the concept of PPP projects, BOT and BOOT Projects.

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## FACULTY OF ENGINEERING

**B.E. 4/4 (Civil) I - Semester (Suppl.) Examination, May / June 2018**  
**Subject: Construction Management and Administration**

**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 are the objectives of construction management? (3)
- 2) List out the advantages and disadvantages of Line organization. (3)
- 3) Define Float and activity? (3)
- 4) What is optimistic time and most likely time? (3)
- 5) What is a work break down structure? (3)
- 6) What is EMD and security deposit? (2)
- 7) What is NIT? (2)
- 8) Define BOT, BOO, BOOT and PPP. (2)
- 9) What is an unbounded solution? (2)
- 10) Mention the conical form of LP? (2)

### PART-B (50 Marks)

- 11) a) Explain the function of construction management  
 b) Explain Functional Organization with its advantages and disadvantages. (4+6)
- 12) Calculate the total project duration and identify the critical path for the following project.  
 Also calculate slack.

Activity	Duration
0-1	2
1-2	4
2-3	2
3-4	5
2-5	1
4-5	1
0-6	1
3-7	8
6-7	3
5-8	3
7-8	5

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- 13) The following data refers to a construction project. The indirect cost of the project is Rs 3,500/month. Determine the optimum cost and duration for the project.

Activity	Normal Duration (Months)	Normal Cost (Rs)	Crash Duration (Months)	Crash Cost (Rs)
1-2	6	7000	3	14,500
1-3	8	4000	5	8,500
2-3	4	6000	1	9,000
2-4	5	8000	3	15,000
3-4	5	5000	3	11,000

- 14(a) Discuss in brief the various safety measures for the demolition of an existing building?

(b) Enumerate the salient features of Contract Labour Act?

- 15(a) Mention the various causes of accidents in construction industry (4+6)

b) Solve by graphical method

$$\text{Minimize } Z = 20X_1 + 10 X_2$$

Subject to constraints

$$X_1 + 2 X_2 \leq 40$$

$$3X_1 + X_2 \leq 30$$

$$4X_1 + 3X_2 \geq 60$$

$$\text{and } X_1, X_2 \geq 0$$

- 16) Optimize the following linear programming model (10)

$$\text{Minimize } Z = 5 X_1 + 3 X_2$$

Subject to constraints

$$2 X_1 + 4 X_2 \leq 12$$

$$2 X_1 + 2 X_2 = 10$$

$$5 X_1 + 2 X_2 \geq 10$$

$$\text{and } X_1, X_2 \geq 0$$

- 17) Write short notes on any two of the following (10)

a) Important conditions of contract

b) Tender documents.

c) Types of contract

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**FACULTY OF ENGINEERING****B.E. 4/4 (Inst.) I Semester (Suppl) Examination, May / June 2018****Subject: Virtual Instrumentation****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. Compare data flow programming with non data flow programming 2
2. Discuss any one method to create sub-VI 3
3. Distinguish local and global variable 2
4. What is a case structure? Write its types. 3
5. Write the difference between timers and counters. 2
6. What is PXI? Where it is used. 3
7. Draw block and show front panel of a VI to find FFT of a signal. 3
8. Why current loop communication is more secure than voltage? 2
9. List the components of DAS. 3
10. What is single drop and multi drop interfacing with buses? 2

**PART-B (50 Marks)**

11. Give a detail discussion on History evolution of virtual instrumentation from conventional instrumentation 10
12. Explain the different components and front panel and block diagram with examples 10
13. What is the use of ADC, DAC and DIO in data acquisition? Explain with an example. 10
14. What is IEEE488 bus? Explain its pin configuration. 10
15. Write short notes on
  - i) IVI drivers
  - ii) DAC and DMA
16. List and explain the important image processing algorithm. Discuss the necessary software and hardware available for the same in NI for Lab VIEW. 10
17. Write the features of RS232C? Explain its signals and functions 10



**FACULTY OF ENGINEERING**  
**BE 4/4 (ECE) I Sem (Suppl.) (Main) Examination May / June 2018**

**SUBJECT: ELECTRONIC INSTRUMENTATION**

**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 accuracy, precision and resolution. 2
- 2) The expected value of the voltage across a resistor is 80 V. However, the measurement gives a value of 79 V. Calculate absolute error, percentage error, relative accuracy and % of accuracy. 3
- 3) List the factors for selection of a transducer. 2
- 4) State the difference between photo-conductive, photo-voltaic and photo-emissive transducers. 3
- 5) Define sound pressure level and sound power level. 2
- 6) Explain humidity measurement using resistive type. 3
- 7) List out the salient features of mixed signal oscilloscope. 2
- 8) Draw the block diagram of data acquisition system. 3
- 9) Name three basic types of electrodes for measurement of bio-potential. 2
- 10) Explain the magnetic resonance and imaging system. 3

**PART-B (50 Marks)**

11. a) Enumerate the types of errors that are likely to occur in measurement and show how such errors can be minimized and evaluated. 6  
 b) Explain the different IEEE Standards. 4
12. a) Explain in detail the construction and operating principle of Linear Variable Differential transformer ( LVDT ) and mention its advantages and disadvantages. 6  
 b) Explain how temperature is measured using semiconductor thermometer. 4
13. a) With the help of neat diagram, explain the principle and operation of Dual Slope Integrating type DVM. 6  
 b) Explain about the various features and functionality of digital LCR meter. 4
14. a) Draw a typical sound level meter and explain. 6  
 b) Explain the construction and working principle of microphone. 4
15. a) Explain the operating principle of CT Scanners with neat diagram 6  
 b) Discuss the ECG with the help of electrocardiogram wave form. 4
16. a) Explain with a neat sketch a transducer used to measure acceleration. 6  
 b) Briefly explain the working principle of a thermocouple. 4
17. Write short note on 5  
 a) IEEE 488 or GPIB Interface and protocol. 5  
 b) Elements of ISO 9001 Standards. 5

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## FACULTY OF ENGINEERING

**B.E. 4/4 (ECE) I-Semester (OLD) Examination, May /June 2018**

**Subject: Computer Networks**

**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 the key elements of a protocol. (2)
2. What are the functions of data link layer? (3)
3. Differentiate between pure and slotted ALOHA. (3)
4. Explain in detail the different types of packet switching with examples. (3)
5. What is flooding? Give its advantages. (2)
6. Explain the terms congestion collapse and onset of congestion. (2)
7. Give the services offered by network layer to transport layer. (2)
8. Give the UDP header format and explain the significance of pseudo header concept in checksum calculation. (3)
9. List the components of Electronic mail (3)
10. Define public key and private key. (2)

### PART-B (50 Marks)

11. A) Differentiate between TCP/IP and OSI models. (4)  
 b) Use timing diagram to explain message transfer using HDLC protocol. Also describe the phases involved. (6)
12. a) Give the frame format of IEEE 802.3 and explain each field of the frame. (5)  
 b) Explain the layered model of blue tooth with the help of a neat diagram. Describe how communication takes place between the master and slave(s) in this technology. (5)
13. a) Compare with the help of neat diagrams how ECN and Hop-by-hop backpressure help in traffic throttling. (5)  
 b) Explain the steps involved in finding the shortest path using Dijkstra's Algorithm. (5)
14. a) Explain in detail the elements of transport protocols. (4)  
 b) Draw and explain the TCP segment header. (6)
15. a) Explain the encryption and decryption algorithms. (5)  
 b) What are authentication protocols ? Explain. (5)
16. a) Explain in detail the various LAN topologies (6)  
 b) Explain the DNS name space. (4)
17. Write notes on any two of the following (10)
  - a) tunneling
  - b) Bridges and routers.
  - c) ATM AAL Layer protocols

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**FACULTY OF ENGINEERING**

B.E. 4/4 (Mech.) I - Semester (Suppl.) Examination, May / June 2018

**Subject : Thermal Turbo Machines****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 Distinguish the compression and expansion processes in an isentropic flow on a T-s diagram. (2)
- 2 Classify the waves generated in closed passages. (2)
- 3 State the assumptions for a Fanno flow? Show the Fanno curves with changing mass flow density on a h-s diagram. (3)
- 4 With the help of a sketch show that shock do not occur in a subsonic flow. (2)
- 5 Define "Degree of reaction" in a axial compressor? (2)
- 6 Show with a neat sketch of velocity triangles, the effect of "Pre-whirl" in a centrifugal compressor. (3)
- 7 Draw the velocity triangles for an axial flow impulse stage. (3)
- 8 Write short notes on balancing of axial thrush in a reaction steam turbine. (3)
- 9 Draw a configuration diagram of a Gas Turbine Power Plant for aircraft propulsion. Show the thermodynamic process on a T-s diagram. (3)
- 10 Define Propulsive efficiency of a rocket propulsion system. (2)

**PART – B (50 Marks)**

- 11 A long pipe of 25.4 mm diameter has mean coefficient of friction of 0.003. Air enters the pipe at a Mach number of 2.5, stagnation temperature 310°C and static pressure 0.507 bar. Determine for a section at which the Mach number reaches 1.2 (10)
  - (i) Static pressure and temperature
  - (ii) Stagnation pressure and temperature
  - (iii) Velocity of air
  - (iv) Mass flow rate of air
  - (v) Distance of this section from inlet
- 12 (a) State the assumptions used in the analysis of Rayleigh process and show the process on a T-s diagram. (4)
  - (b) A jet of air at 275 K and 0.69 bar has an initial Mach number of 2.0 if it passes through a normal shock wave determine (i) Mach number (ii) Pressure (iii) Temperature and (iv) Density downstream of the shock (6)
- 13 (a) What are the merits and demerits of centrifugal and axial compressors? (4)
  - (b) A two stage centrifugal compressor delivers 500 m<sup>3</sup>/mm of air. The suction conditions are 1 bar 20°C. The compression ratio and isentropic efficiency of each stage are 1.25 and 80% respectively. Find the isentropic efficiency of the entire compression process. (6)

..2..

- 14 (a) List the methods of compounding a steam turbine and explain one of the methods with a neat sketch. (4)
- (b) Steam flows from a nozzle to De Laval turbine at a velocity of 1000 m/s. The nozzle angle is  $20^\circ$  and the mean blade velocity is 400 m/s. The blades are symmetrical. The mass flow rate is 1000 kg/hr, friction factor is 0.8 nozzle efficiency is 0.95.  
Calculate : (i) Blade angles (ii) Axial thrust (iii) Stage efficiency (6)
- 15 (a) Describe the working of a Pulse jet engine. What are its advantages and disadvantages? (5)
- (b) Determine the propulsive efficiency, thrust and thrust power if and diameter of the aircraft propeller is 4 meters. The speed ratio is 0.8 at a flight speed of 400 kmph. The ambient conditions of the flight are  $T = 256$  K and  $p = 0.54$  bar. (5)
- 16 (a) Draw a configuration diagram and temperature entropy diagram for a gas turbine cycle with inter cooling, reheating and regeneration. (5)
- (b) In a gas turbine plant, operating on Joule cycle, air compressed from 1 bar and  $20^\circ\text{C}$  through a pressure ratio of 5. It is then heated to  $750^\circ\text{C}$  in a combustion chamber and expanded to a pressure of 1 bar. Calculate the network done, cycle efficiency and work ratio. (5)
- 17 Write short notes on the following: (2x5)
- (a) Surging and choking in a compressor
- (b) Rocket applications

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## FACULTY OF ENGINEERING

B.E. 4/4 (Prod.) I - Semester (Suppl.) Examination, May / June 2018

Subject : Control System Theory

Time : 3 Hours

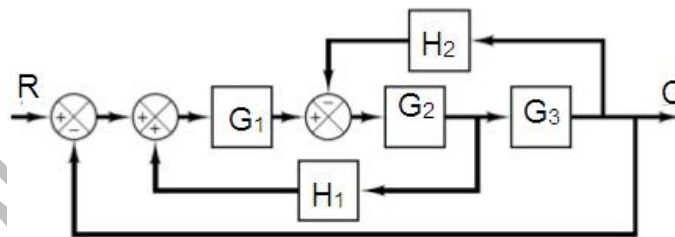
Max. Marks: 75

**Note: Answer all questions from Part-A & answer any five questions from Part-B.****PART – A (25 Marks)**

- 1 Compare AC and DC servomotors.
- 2 Discuss the types of control systems.
- 3 Write the short notes on Mason's gain formula.
- 4 If  $A = \begin{bmatrix} 0 & 1 \\ 2 & 3 \end{bmatrix}$  from S.T.M.
- 5 Determine the steady state errors for the unit step i/p, unit – ramp i/p for  $G(s) = \frac{9}{s(s+1)}$
- 6 Determine the type and order of the system  $G(s) = \frac{k(s+1)}{s^2(s+2)(s+3)}$
- 7 Write short notes on PI controller.
- 8 What are the advantages of state space methods over classical control techniques.
- 9 Write the short notes on correlation b/w second order frequency response and time domain specification
- 10 Discuss the types of test signals.

**PART – B (50 Marks)**

- 11 Derive the transfer function of AC servomotor and explain the working principle.
- 12 Solve the given Block Diagram.



- 13 Sketch the root locus plot for open loop transfer function  $G(s) = \frac{K}{s^2(s+1)(s+2)}$ .

- 14 Sketch the Bode plot for  $G(s) = \frac{1000(s+10)}{s(s+1)(s+100)}$ .

- 15 Sketch the Nyquist plot and determine the stability of the system given

$$G(s) = \frac{K}{s(s+1)(s+2)}$$

- 16 Check the controllability and observability of the unity feed system represent by

$$G(s) = \frac{s+3}{s^3+3s^2+2s+1}$$

- 17 Write the short notes on any **three** of the following

- (i) Time response curve
- (ii) Mason's gain formula
- (iii) PID controller

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**FACULTY OF ENGINEERING**

**B.E. 4/4 (AE) I-Semester (Suppl) Examination, May / June 2018**  
**Subject: Transport Management**

**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 personal policy?
2. What are the methods of training?
3. Classify Transport carriers.
4. Differentiate between public and private transport
5. Define route, and commuters
6. What is vehicle utilization?
7. What is the necessity of Permit?
8. What are the different types of traffic signs?
9. What is Breakdown maintenance
10. What is running time.

**PART B**

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|--|----|
| 11. a) Explain job description   | 5  |
| b) Explain various types of employment tests   | 5  |
| 12. a) Explain principle functions of administrative, traffic, secretarial and engineering divisions   |    |
| b) Explain various forms of ownership of transport system  | 4  |
| 13. a) Explain various types of costs  | 5  |
| b) What are the requirements of good fare system   | 5  |
| 14. What are the constructional regulations, descriptions of vehicle tankers, tippers, delivery vans, recovery vans, Ambulance vehicle fire fighting equipment | 10 |
| 15. a) Explain in detail about Preventive maintenance  | 4  |
| b) Write the maintenance procedure for better fuel economy   | 6  |
| 16 Explain tyre maintenance procedure and causes and remedies for the uneven tyre wear   |    |
| 17. Write short notes on:  |    |
| a) Bus depot lay out   | 5  |
| b) Fitness certificate for vehicles  | 5  |

**FACULTY OF ENGINEERING**  
**B.E. 4/4 (CSE) I - Semester (Suppl.) Examination, May / June 2018**

**Subject : Distributed Systems**

**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 What are the challenges in Distributed Systems? (3)
- 2 Differentiate between Distributed systems and computer networks. (2)
- 3 What is Name Space? (2)
- 4 What are the uses of Events and Notifications in DS? (3)
- 5 Discuss distributed mutual exclusion. (3)
- 6 Define strongly consistent global state. (2)
- 7 Define flat and distributed transactions. (3)
- 8 What is atomic commit protocol? (2)
- 9 Define Granularity in Distributed shared memory management. (2)
- 10 List various task of recovery manager. (3)

**PART – B (50 Marks)**

- 11 (a) Discuss in brief about architectural model of DS. (5)  
 (b) Explain layered architecture for distributed systems. (5)
- 12 (a) Explain how a new process is created in Distributed systems. (5)  
 (b) How is directory service implemented in distributed systems? (5)
- 13 (a) Explain about distributed debugging. (4)  
 (b) What is election algorithm? Explain Bully algorithm. (6)
- 14 (a) Explain nested transactions. (4)  
 (b) What are distributed deadlocks? Explain. (6)
- 15 (a) Explain sequential consistency in DSM. (5)  
 (b) Explain File Management in SUN network file system. (5)
- 16 Explain in detail about concurrency control in distributed transactions. (10)
17. Write short notes on:
  - (a) CODA files system Architecture. (4)
  - (b) Release consistency. (4)
  - (c) RMI. (2)

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