

FACULTY OF ENGINEERING
B.E. 4/4 (Civil) I - Semester (Suppl.) Examination, May / June 2017

Subject : Estimating and Specification

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 Enumerate the difference between load bearing structure and framed structure in estimation of building. (3)
- 2 How can you calculate economical depth of canal? (3)
- 3 Write down the weights of 10 mm, 12 mm, 16 mm, 20 mm and 25 mm steel rods (for 1 metre length). (3)
- 4 State different methods of estimating steel for R.C.C. work in a building. (3)
- 5 What is the importance of standard schedule of rates? (2)
- 6 Define Analysis of rates. Write few steps taken into consideration for preparing detailed analysis of rates. (3)
- 7 Differentiate between general specifications and detailed specification. (2)
- 8 What are the essential requirements of a valid contract? (2)
- 9 Define 'Earnest money deposit (EMD)'. Why and when are they collected? (2)
- 10 Write a note on BOT and BOOT projects. (2)

PART – B (50 Marks)

- 11 The plan and sectional elevation of a building are given in figure 1. Estimate the quantities of the following items of works of the building. (10)
 - (a) Earth work excavation in foundation
 - (b) R.C. C. work in Roof-Slab and Lintel Beam
- 12 Compute the quantity of steel reinforcement in an R.C.C. roof slab of 5 metres clear span and 6.0 metre long, having 12 mm dia main bars at 15 cm c/c and 8 mm dia distribution bars at 20 cm c/c with alternate bent up bars. Extra rods of 10 mm dia bars at 12 cm cc are provided at each corner of a slab for a length of 1meter. Also prepare the schedule of bars for the RCC slab.
- 13 (a) Explain the factors affecting analysis of rates. (4)
 - (b) Find out the brick work in foundation and plinth with 9" x 4 ½ " x 3" (nominal size) with cement mortar 1 : 4. Cost of brick Rs. 4.50/- and 1200/- cum cement Rs. 350/- per bag. The labour requirement per cum is Head Masson ½ no, Masons 8 nos and mazdoors 15 nos and the corresponding rates are Rs.450/-, Rs.400/-, Rs.350/- respectively. (6)
- 14 Write down the detailed specification for the following items of works: (10)
 - (a) Earthwork in excavation in foundation
 - (b) Reinforced cement concrete (RCC)
 - (c) Damp proof course 2.5 cm of cement concrete 1 : 1 ½ : 3
 - (d) Brick work first class

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- 15 (a) Explain about the contents of a typical tender notice. (4)
(b) Explain the documents to be attached to a contract document in detail. (6)
- 16 Prepare a Rate Analysis for 25 cu,m. RCC M20 slab. (10)
- 17 Write short notes on the following: (2 ½ x4)
(a) Types of estimates
(b) Security money deposit
(c) Liquidated damages and unliquidated damages
(d) e-tendering

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FACULTY OF ENGINEERING
B.E. 4/4 (Inst.) I - Semester (Suppl.) Examination, May / June 2017

Subject : Virtual Instrumentation

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 Give an overview of virtual instrument and LabVIEW. (2)
- 2 What are the rules for writing virtual instrumentation programs (3)
- 3 Write about the short cuts in LabVIEW. (2)
- 4 What is the function and control palette. (3)
- 5 Draw the simplified N-bit SAR ADC. (2)
- 6 Mention the differences between Timers and counters. (3)
- 7 How many devices can be connected to USB bus? (3)
- 8 List out the properties of SCXI. (2)
- 9 Which software of LabVIEW is used for image processing application. (3)
- 10 Draw the diagram of IEEE bus concept . (2)

Part B (5x10=50 Marks)

- 11 Explain history and evolution of Virtual Instrumentation. Draw the block diagram of Instrumentation system. (10)
- 12 (a) Write short notes on clusters. (5)
(b) What is formula node? Explain. (5)
- 13 (a) With sketches explain the DAC architecture types. (5)
(b) Write short notes on timing, interrupts and DMA. (5)
- 14 (a) Write short notes on VXI and PXI. (5)
(b) Explain with suitable diagram and Interface buses. (5)
- 15 (a) Write a LabVIEW program for power spectrum evaluation. (5)
(b) With help of VI explain motor control application. (5)
- 16 (a) Discuss briefly architecture of virtual instrument . (5)
(b) Write short notes on serial communication bus. (5)
- 17 (a) Write short notes on Local and global variables. (5)
(b) Write short notes on DIO. (5)

FACULTY OF ENGINEERING
B.E. 4/4 (ECE) I - Semester (Suppl.) Examination, May / June 2017

Subject : Computer Networks

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 is the advantage of layered protocol architecture? (2)
- 2 Explain the importance of framing with reference to data link layer. (3)
- 3 Illustrate the frame format of IEEE 802.3. (3)
- 4 Compare pure ALOHA and slotted ALOHA with reference to channel utilization. (2)
- 5 What are the disadvantages of flooding? List out the techniques of improving flooding. (2)
- 6 What is Count-to-infinity problem? (3)
- 7 List out various transport services. (3)
- 8 What are the applications of UDP? (2)
- 9 With the help of figure illustrate the basic elements of Product-Cipher. (3)
- 10 Describe the importance of MIME. (2)

PART – B (50 Marks)

- 11 (a) Describe TCP / IP model and contrast it with ISO-OSI model. (7)
 (b) Compare Network topologies. (3)
- 12 (a) Illustrate IEEE 802.16 frame structure and compare it with IEEE 802.11. (7)
 (b) Explain the importance of MAC sublayer. (3)
- 13 (a) What are adaptive and non adaptive routing algorithms? Describe any two routing algorithms. (7)
 (b) What is a spanning tree? (3)
- 14 (a) Describe TCP protocol and the TCP segment header. (8)
 (b) What is congestion? List out various methods to control congestion. (2)
- 15 (a) Describe ATM AAL Layer protocol. (6)
 (b) Explain world wide web. (4)
- 16 (a) Describe and contrast symmetric key and public key algorithms. (7)
 (b) Explain Domain Name System. (3)
- 17 Write notes on any **two** of the following: (10)
 (a) Tunneling
 (b) IP addresses
 (c) Bluetooth

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B.E. 4/4 (Mech.) I - Semester (Suppl.) Examination, May / June 2017

Subject : Thermal Turbo Machines**Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A and answer any five questions from Part-B.**

- i. Answer **all questions in part-A and any five questions from Part-B**
- ii. Answer to the questions of Part-A must be at one place and in the same order as they occur in the question paper
- iii. Candidate is advised not to attempt more questions than required.
- iv. Missing data if any may suitably be assumed
- v. Use of data of book is permitted
- vi. Unless otherwise stated $\gamma=1.4$, $C_p=1.005$ kJ/kg

PART- A (25 Marks)

1. Prove that flow must be subsonic for convergent nozzle.
2. Show that compressibility factor do not depend on Mach number for incompressible fluids.
3. Show that at maximum entropy point on Rayleigh curve, $M=1$.
4. What are the applications of Fanno and Rayleigh curves?
5. Show that pressure rise per stage is higher for centrifugal compressor than axial flow compressor.
6. Draw velocity diagrams for backward vanes for centrifugal compressor.
7. Draw pressure velocity variation across the blades of pressure compounded steam turbine.
8. Draw velocity diagram on common base of peripheral velocity of blade for steam turbine.
9. Give two examples each for liquid propellant and solid propellant.
10. Differentiate between optimum pressure ratio and maximum pressure ratio for gas turbine.

PART-B (50 Marks)

11. A gas ($\gamma=1.4$, $R= 0.287$ kJ/kg-K) at $p_1= 1.0$ bar , $T_1=400$ K enters a 30 cm diameter duct at a Mach number of 2.0. A normal shock occurs at a Mach number of 1.5 and exit Mach number is 1.0. If the mean value of the friction factor is 0.003, determine i) length of the duct upstream and downstream of the shock wave, ii) mass flow rate of gas.
12. The Mach number at the exit of a combustion chamber is 0.9. The ratio of stagnation temperatures at exit and entry is 3.74. If the pressure and temperature of the gas at exit are 2.5 bar and 1273 K respectively, determine i) Mach number, pressure and temperature of the gas at entry ii) the heat supplied per kg of the gas and iii) maximum heat, that can be supplied.
13. An axial flow compressor with an overall isentropic efficiency of 90% draws air at 20°C and compresses it in the pressure ratio of 4:1. The mean blade speed and flow velocity are constant throughout the compressor. Assume 50% reaction blading and taking blade velocity as 200 m/s and work input factor as 0.82, calculate i) flow velocity and ii) number of stages. Assume $\alpha = 12^\circ$ and $\theta = 42^\circ$.

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14. In a simple impulse turbine the nozzles are inclined at 20° to the direction of motion of the moving blades. The steam leaves the nozzles at 375 m/s. The blade speed is 165 m/s, Find suitable inlet and outlet angles for the blades in order that the axial thrust is zero. The relative velocity of steam as it flows over the blade is reduced by 15% by friction. Determine also the power developed for a flow rate of 10 kg/s. (Solve this by graphical method).
15. Air enters at 1 bar and 15°C into the compressor at constant pressure open cycle gas turbine plant and leaves the compressor at 6 bar. Temperature of the gases entering the turbine = 700°C . Pressure losses in the combustion chamber = 0.1 bar, Isentropic efficiency of the compressor = 80%, Isentropic efficiency of the turbine = 80%, Efficiency of the combustion = 90%, Take $\gamma = 1.4$ and $C_p = 1.005 \text{ kJ/kg-K}$ for the air and gases, Find (i) the quantity of the air circulation in the system, if the plant develops 1200 kW, (ii) Heat supplied per kg of air circulation and (iii) Thermal efficiency of the cycle. Neglect the mass of the fuel.
16. Explain the working principle of turbojet engine with the help of configuration diagram, T-s diagram and list out its merits and demerits over pulse jet.
17. A single eye, single stage centrifugal compressor with radial impeller delivers 18 kg of air per second with a pressure ratio of 4, when running at 14500 rpm. The pressure and temperature of the air at the suction side are 1.0 bar and 16°C . Assume slip factor = 0.9, work input factor = 1.04, Isentropic efficiency = 75%. Find i) the input power required to drive the compressor if the ratio of root diameter to tip diameter of impeller is 0.75, ii) blade angle at the impeller eye, if the velocity of flow is 62 m/s which is constant throughout the impeller, iii) diffuser angle at outlet and iv) reduction in work done on compressor if absolute velocity at inlet flows at angle of 15° through pre-whirl.

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B.E. 4/4 (Prod.) II - Semester (Suppl.) Examination, May / June 2017

Subject : Control System Theory

Time : 3 Hours

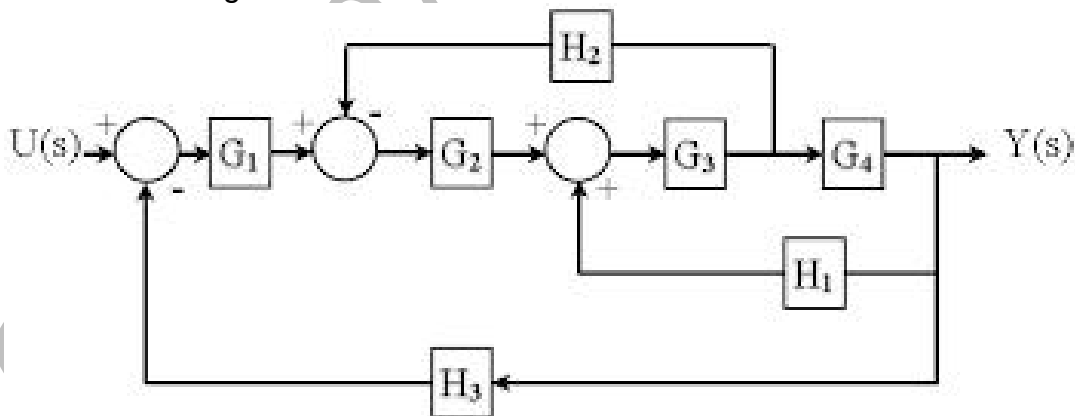
Max. Marks: 75

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

- Find the Laplace transform $F(t) = e^{-3t} \cos 3t$
- What is the effect of negative feedback on the control system.
- Compare open loop and closed loop systems
- Find the transfer function of a second order system that yields a 14.6% overshoot and a settling time of 1.5 seconds.
- State the properties of state transition matrix.
- Write the short notes on PI controller.
- If $A = \begin{bmatrix} 0 & 1 \\ -1 & 3 \end{bmatrix}$ find $\phi(t)$.
- Determine the range of K for the system to be stable represented by $G(s) = K(S+2)/S(S-1)(S+3)$
- The unit step response test conducted on a second order system yielded $M_p=0.4$ and $t_p=0.2$ ms obtains the corresponding frequency response indices of the system.
- Discuss the types of control systems.

PART – B (50 Marks)

- Derive the transfer function of the DC servomotor and explain working principles
- Solve the block Diagram



- Sketch the Root Loci for unity feedback system with $G(S) = \frac{K}{s(s+1)(s+2)}$ find the value of K.
- Sketch bode plot and determine gain cross over frequency phase cross over frequency, gain margin and phase margin for $G(S) = \frac{500e^{-0.1s}}{s(s+10)(s+100)}$
- Sketch the Nyquist plot and determine the stability of system given by

$$G(S) = \frac{K}{s(s^2 + 3s + 4)}$$

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16. Check the controllability and observability of the unity feed system represented by

$$G(S) = \frac{5s^2 + 15s + 35}{s^3 + 4s^2 + 14s + 20}$$

17. Write the short notes on the following

- (i) PID controller
- (ii) Type of state space representations.
- (iii) Transfer function of a pneumatic system

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FACULTY OF ENGINEERING**B.E. 4/4 (AE) I – Semester (Suppl.) Examination, May / June 2017****Subject: Transport Management****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 Define Personal Management. Explain words used in definition.
- 2 What are the sources of new employees?
- 3 Draw the organization structure of transport organization.
- 4 State various types of ownership of motor transport organization.
- 5 Define Route Schedule.
- 6 What is "Running time"?
- 7 What is the necessity of Registration?
- 8 State the importance of Traffic signs.
- 9 What is preventive maintenance?
- 10 What are the factors to be considered for the selection of site for depot?

PART – B (5x10 = 50 Marks)

- 11 a) Explain procedure for conducting interview. 5
b) Explain various types of employment tests. 5
- 12 a) Explain principle functions of administrative, traffic, secretarial and engineering divisions. 6
b) Explain various types of costs. 4
- 13 a) Explain different types of fare methods. 5
b) Explain bus scheduling. 5
- 14 a) Classify the Permits based on validity period. 5
b) Explain mandatory traffic signs. 5
- 15 What are the constructional regulations, descriptions of vehicle tankers, tippers, recovery vans, ambulance vehicle, and firefighting equipment? 10
- 16 Explain causes of uneven tyre wear and their remedies. 10
- 17 Write short notes on:
a) Better fuel economy 5
b) Psychological tests. 5

FACULTY OF ENGINEERING
B.E. 4/4 (CSE) I - Semester (Suppl.) Examination, May / June 2017

Subject : Distributed Systems

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 goals of Distributed systems? (3)
- 2 Define Process. (2)
- 3 Differentiate between Marshalling and Unmarshalling. (3)
- 4 Define RMI. (2)
- 5 What is Byzantine agreement problem? (3)
- 6 What is Multicast communication? (2)
- 7 What are nested transaction? Give example. (3)
- 8 What is atomic commit process? (2)
- 9 Differentiate weak consistency and strong consistency. (3)
- 10 List various task of recovery manager. (2)

PART – B (50 Marks)

- 11 (a) Discuss briefly about the architectural models of distributed systems. (5)
 (b) Explain resource sharing in Distributed systems. (5)
- 12 (a) Discuss how inter process communication is carried out in UNIX. (5)
 (b) Explain Remote Procedure call. (5)
- 13 (a) Explain the concept of Global states. (5)
 (b) What are election algorithms? Explain Bully algorithm. (5)
- 14 (a) Explain how to achieve concurrency control in distributed transactions. (5)
 (b) Explain various fault tolerant services. (5)
- 15 (a) Discuss about the implementation issues of DSM. (5)
 (b) Explain SUN network file system. (5)
- 16 (a) Explain CODA file system architecture. (5)
 (b) Explain how directory service is implemented in distributed systems. (5)
- 17 Write short notes on the following:
 - (a) Logical time and logical clocks (4)
 - (b) Distributed deadlocks (3)
 - (c) Name service (3)
