FACULTY OF ENGINEERING

B.E. 3/4 (Civil) I-Semester (Old) Examination, Nov. / Dec. 2016

Subject : Building Technology and Services

Time : 3 hours   Max. Marks : 75

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

PART – A (10 x 2.5 = 25 Marks)

1   State any two objectives of building byelaws.

2   Mention the importance of grouping in the principles of planning of buildings.

3   What are dead spots?

4   List out any three sound absorbent materials.

5   Discuss about safety precautions for lifts.

6   State the parameters that affect water supply in buildings.

7   Write the principles of green building.

8   List out different low energy materials used in green buildings.

9   What are Boolean commands?

10 Write about the command 'INTERFERE'.

PART – B (50 Marks)

11 a) What is planning with respect to buildings? Mention the factors to be considered for selecting the site for a residential building.
   b) Explain natural ventilation and artificial ventilation.

12 a) As per building bye laws, explain principles of ventilation in buildings.
   b) Define 'circulation'. And explain the design process of a small stair case in a residential building.

13 a) What is meant by reverberation? And how to determine this parameter.
   b) Explain the phenomenon of sound distribution in an auditorium.

14 Draw a typical water supply arrangement inside a small residential building.

15 a) Explain the meaning of Green building. State the different ratings of green buildings under LEED.
   b) Write a short note on energy consumption in buildings.

16 a) Discuss about effective cooling and heating systems in green buildings.
   b) Write solid editing commands in Auto CAD 3D.

17 a) State some design considerations to make a building fire resistant.
   a) Describe different factors affecting the 'acoustics' of buildings.

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FACULTY OF ENGINEERING

B.E. 3/4 (Civil) I - Semester (New)(Main) Examination, November / December 2016

Subject : Building Technology and Services

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 'Prospect' of buildings
2. What are design considerations for comfort?
3. List out any three sound absorbent materials.
4. What is meant by acoustic intensity?
5. What are the basic laws considered while installing water supply in houses?
6. Explain briefly effect water conservation system.
7. Discuss the concept of green buildings.
8. List out different low energy materials used in green buildings.
9. What are the Boolean commands?
10. Differentiate between 'union' and 'subtract' commands.

PART – B (50 Marks)

11. (a) What is meant by building bye-laws? What are the common errors found in planning a building?
    (b) List out different principles of planning of buildings. And explain groupings of rooms.

12. (a) Write about the requisites for good acoustics.
    (b) Explain in detail about Resonant Panel Absorbents and Cavity Resonators.

13. (a) What are the different sanitary fittings normally used in buildings? Explain in detail about the function of flushing cistern.
    (b) Classify various materials used in buildings from fire resistance point of view.

14. (a) Explain the meaning of Green building. State the different ratings of green buildings under LEED.
    (b) Write a short note on energy consumptions in buildings.

15. Draw plan of a residence comprising of Drawing room, Dining room, Kitchen with store, two bed rooms with attached toilets by providing appropriate dimensions for each room. Locate doors and windows at appropriate locations.

16. (a) Explain about data collection relating to different buildings.
    (b) Discuss the process of measuring acoustic intensity and absorption coefficient.

17. Write short notes on the following:
    (a) Fire safety measures in residential buildings
    (b) Different views in Auto CAD 3D

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FACULTY OF ENGINEERING

B.E. 3/4 (EEE/Inst.) I - Semester (Old) Examination, November / December 2016

Subject : Digital Electronics and Logic Design

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 State Absorption laws.   (2)
2 Express the Boolean function $F = AB + \overline{A}\,C$ in a product of maxterms.   (3)
3 Differentiate between Encoder and Decoder.   (3)
4 What is a Code converter?   (2)
5 Realize a 1-bit comparator.   (3)
6 Give an example for excess-3 arithmetic.   (2)
7 Distinguish between a truth table and excitation table.   (3)
8 What are the applications of shift registers?   (2)
9 What is a sequence detector?   (3)
10 Discuss about PAL.   (2)

PART – B (50 Marks)

11 Use the tabular procedure to simplify the given expression   (10)
$$F(V, W, X, Y, Z) = \Sigma m\ (0, 4, 12, 16, 19, 24, 27, 28, 29, 31)$$

12 (a) Simplify the following Boolean expression to a minimum number of literals   (5)
$$(\overline{A} + C)(\overline{A} + \overline{C})(\overline{A} + B + \overline{C}D)$$

   (b) Express the following function as sum of minterms and product of maxterms: (5)
   $F(x, y, z) = (xy + z)(xz + y)$.

13 Discuss about:
   (a) Full adder   (5)
   (b) Half subtractor   (5)

14 (a) Explain the operation of SR flip flop.   (5)
   (b) Discuss about general BCD counter.   (5)

15 What do you know about PROM, PLA and PAL? Give an example.   (10)

16 (a) Show the dual form of the following expression: (5)

   (i) $A + B(\overline{C + \overline{\overline{DE}}}) = A + B\overline{C}DE$

   (ii) $\overline{\overline{\overline{AB} + \overline{A}} + AB} = 0$

   (iii) $\overline{A\overline{B} + ABC + A(B + A\overline{B})} = 0$

   (iv) $A + \overline{B}C = (A + \overline{B})(A + C)$

   (v) $AB + \overline{AC} + A\overline{B}C(AB + C) = 1$

   (b) Explain about DTL.   (5)

17   Write short notes on the following:
      (a) Basic latch circuit   (5)
      (b) TTL Subfamilies   (5)

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FACULTY OF ENGINEERING

B.E. 3/4 (EEE/Inst.) I-Semester (New) (Main) Examination, Nov. / Dec. 2016

Subject : Digital Electronics and Logic Design

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 Obtain the operation NOT and OR operations neither using NOR gates.   2
2 Use De Morgan's theorem to convert the Boolean expression to its minterm form.   3

$$\overline{(A+\overline{B}+C+D)} - \overline{(A+\overline{B}+\overline{C}-\overline{D})} = Y$$

3 How do you characterize or define a combinational circuit? How does it differ from a sequential circuit? Give two examples each of combinational and sequential logic devices.   3
4 Use 2's compliment and subtract 11101-1101.   2
5 Compare the standard TTL, lower-power Schottky TTL and Schottky TTL on the basis of speed, power dissipation and fan-out capability.   3
6 Can a multiplexer be used to realize a logic function? If yes, in what ways this realization is better than realizing using gates.   2
7 What is the minimum number of selection lines required for selecting one out of n input lines?   2
8 Implement a Master Slave flip flop using a 2 to 1 Mux.   3
9 List the applications of PLA.   2
10 Define Mealy and Moore machines.   3

PART – B (50 Marks)

11 a) Explain the laws of Boolean algebra.   5

   b) Implement the expression $X = \overline{(A + B + C + D)}DE$ by using NAND logic.   5

12 a) Add + 50.75 to -50.75 using the 12 bit 2's compliment arithmetic.   5
   b) Form fundamentals design for an 8 bit adder using two 4 bit adders.   5

13 Minimize the following function using Q-M approach
   $f(A,B,C,D) = \sum m(1,4,6,8,14,17,22,27,28) + d(12,15,19,30,31)$.   10

14 a) Explain how the JK flip flop can be converted to D flip flop.   4
   b) Draw and explain logic diagram of 4 bit binary ripple counter.   6

15 a) Realize the following function using PLA
       $F(w,x,y,z) = (0,3,5,7,8,1215) + d(2,6,9)$.   6
   b) What are the steps for the design of asynchronous sequential circuits?   4

16 a) Discuss about multiple output minimization. Give an example.   5
   b) Design a 32 : 1 multiplexer using two 16 : 1 and 2 : 1 multiplexers.   5

17 Design a sequence detector circuit to detect a sequence of 10101. It should produce an output 1 when the input pattern has been detected. Consider over-lapping.   10

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FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I - Semester (Old) Examination, November / December 2016

Subject : Analog Communication

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 the term modulation index for AM. (2)

2 Write the methods of generation for SSB-SC signal. (2)

3 Derive an expression for single tone FM wave (3)

4 In an FM system if modulation index is doubled and modulating frequency is reduced four times, what is the effect on the frequency deviation? (2)

5 Write the advantage of super heterodyning. (3)

6 Explain the operation of a noise limiter in FM receivers? (3)

7 State central limiting theorem. (2)

8 Explain noise equivalent bandwidth. (3)

9 Explain in brief about Bit interleaving in TDM. (3)

10 What is need of Pulse modulation? (2)

PART – B (50 Marks)

11 (a) Explain the operation of a balanced slope detector, giving circuit diagram and response characteristic. What are its draw backs? (5)
   (b) Derive an expression for the total transmitter power in the AM wave. Also obtain its efficiency. (5)

12 (a) Explain the Armstrong method of FM generation. (6)
   (b) An FM wave is represented by $V = 12 \sin (6 \times 10^8 t + 5 \sin 1250t)$.Find the carrier and modulating frequencies, the modulation index and maximum deviation of FM wave. Is it narrow band or wideband FM? What power this FM will dissipate in a 10 ohm resistor? (4)

13 (a) Draw the block diagram of Super heterodyne receiver designed to receive FM signals and explain its working. (5)
   (b) Explain about choice of intermediate frequency in AM receiver. (5)

14 (a) Find the power spectral density of Noise in case of SSB-SC and also calculate Figure of merit. (6)
   (b) Calculate the system noise of a receiver that has a bandwidth of 6 MHz and an input noise temperature of 25° K to the antenna. The equivalent noise resistance of receiver is 75 ohms. The antenna has a resistance of 72 ohms. Assume $T_o = 290^o$K. (4)

..2

15 (a) State and prove the sampling theorem for the low pass signals.. (5)
   (b) What is Pulse Amplitude modulation and describe briefly its generation and demodulation with the help of input and output waveforms. (5)

16 (a) What is pre-emphasis? Sketch a typical pre-emphasis circuit & explain why de-emphasis must be used. (6)
   (b) Calculate the percentage Power saving when the Carrier and one of the sidebands are suppressed in an AM Wave modulated to a depth of (i) 100 percent (ii) 50 percent (4)

17   Write short notes on any **two** of the following: (10)
      (a) Vestigial Sideband Modulation(VSB)
      (b) TRF receiver

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FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I-Semester (New) (Main) Examination, Nov. / Dec. 2016

Subject : Analog Communication

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 Write the properties of Hillbert transform.	2
2 The total power content of an AM wave is 600W. Determine the percent modulation of signal, if each of the side band contains 75W.	3
3 Explain capture effect.	2
4 With neat waveform explain frequency modulation and derive an expression for FM wave.	3
5 What is the need of limiter circuit in FM receiver?	2
6 Write the advantage of super heterodyning.	3
7 What are external and internal noises?	3
8 Define noise figure.	2
9 Explain the difference between natural sampling and Flat-top sampling.	3
10 Draw the block diagram of Pulse amplitude modulation.	2

PART – B (50 Marks)

11	a) Explain the working of Ring modulator for generation of DSBSC wave.	6
	b) A carrier wave of frequency 1 MHz is modulated 50% by a sine wave of 5 KHz. The resulting AM signal is passed through a parallel resonant circuit (RLC) tuned to carrier frequency and has Q = 175. Determine the percentage modulation of the output signal.	4
12	a) Discuss the parameter variation method for generation of FM signals.	5
	b) Obtain mathematical representation of FM and PM.	5
13	a) Write a note on FM Receiver or describe superhetrodyne FM receiver.	6
	b) Distinguish between simple AGC and delayed AGC.	4
14	a) Explain using phasor diagram the effect of noise on frequency modulation.	6
	b) Calculate the system noise of a receiver that has a bandwidth of 6 MHz and an input noise temperature of 250 K to the antenna. The equivalent noise resistance of receiver is 75 ohms. The antenna has a resistance of 72 ohms. Assume $T_0 = 290^0$K.	4
15	a) State and prove the sampling theorem for the low pass signals.	6
	b) What is need of pulse modulation? Explain the various methods used for pulse modulation.	4
16	a) What will happen if a PM signal is received by an FM receiver and vice versa? Also describe the narrowband frequency modulation.	5
	b) Explain the importance of AVC and explain its operation.	5
17	Write short notes on the following :	
	a) Image Rejection ratio	5
	b) Vestigial sideband modulation (VSB)	5

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FACULTY OF ENGINEERING

B.E. 3/4 (Mech.) I-Semester (Old) Examination, Nov. / Dec. 2016

Subject : Hydraulic Machinery and 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 The force exerted by a jet of water on a stationery vertical plate in the direction of jet is given by
   a) $Fx = \rho AV2 \sin2\theta$ b) $Fx = \rho AV2[1+\cos\theta]$ c) $Fx = \rho AV2$ d) none of the above   2

2 The magnitude of the force exerted by a jet of cross sectional area 2000 mm^2 and of velocity 25 m/s on a fixed smooth curved vane which deflects the jet by 1200 is given by :
   a) 21.65   b) 20.70   c) 21.56   d) 23.72   3

3 Classify the different types of turbines and pumps.   3

4 What is the significance of priming in centrifugal pump?   2

5 Differentiate between inward and outward radial flow reaction turbine.   3

6 What are the conditions that influence the performance of turbines?   3

7 Explain the function of draft tube.   2

8 List out the functions of air vessel.   3

9 The power developed by a hydraulic cylinder equals the product of its   2
   a) Force and velocity   b) Length and time
   c) Discharge and area   d) None of the above

10 The hydraulic power developed by pump is converted back into mechanical energy by
   a) Hydraulic actuators   b) external pump
   c) Compressor   d) all of the above   2

PART – B (50 Marks)

11 A jet of water of 5 cm dia impinges on a curved vane and defected through an angle of 175 deg the vane moves in the same direction as that of jet with a velocity of jet 35 m/s. If the rate of flow is 170 Lps. Determine the component force on the vane in the directional motion. How much would be power developed and what would be the vane efficiency?

12 Explain with a neat sketch the working of a single stage centrifugal pump. List merits and demerits over reciprocating pump.   10

13 For a Kaplan turbine with a runner diameter 4 meter the discharge is 60 cubic meters/sec and the hydraulic and mechanical efficiencies 90% and 94% resp. The dia of boss is 0.3 times the runner dia and speed ratio is 2.0. Assuming that discharge is free and there is no whirl at outlet, calculate the net available head on the turbine and specific speed.   10

..2

14 Explain the working principle of single acting and double acting reciprocating pump. Derive the power developed in case of single acting pumps.   10

15 Explain working of Hydro mechanical and electro hydraulic serve systems.   10

16 With a neat labeled diagram, explain the construction and working of Pelton turbine.   10

17 a) Explain about Classification of forces based on impact of jet on vanes.   3
    b) Speed control methods of actuators   3
    c) Variation of pressure head in the suction pipe due to acceleration of piston.   4

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FACULTY OF ENGINEERING

B.E. 3/4 (Mech.) I – Semester (New) (Main) Examination, Nov. / Dec. 2016

Subject: Hydraulic Machinery and 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   A nozzle of 5cm diameter discharges water with a velocity of 50 m/s and strikes to a fixed plate. If the plate is vertical and plate is inclined to the jet by 40°, then the forces acting on the plate is
   a) 4908.7 N and 3155.25 N
   b) 4906 N and 3166 N
   c) 4800 N and 3000 N
   d) 4831 N and 3600 N   3

2   The efficiency of the water jet having a velocity of V and striking a series of vertical plates moving with a velocity is given by

   a) $= \dfrac{2V(V - U)}{U^2}$

   b) $= \dfrac{2U(V - U)}{V^2}$

   c) $= \dfrac{U^2}{V^2(V - U)}$

   d) None of the above.   3

3   In reciprocating pump, cavitation occurs during delivery stroke at
   a) The beginning of the stroke
   b) The end of the stroke
   c) The middle of the stroke
   d) Both (a) and (b)   2

4   A single acting reciprocating pump running at 100 rpm delivers 12 lit/sec of water. The diameter and stroke of the cylinder are 20 cm and 30 cm. The percentage slip of the pump is
   a) 23.6%
   b) 23.4%
   c) 23.2%
   d) 23.8%   3

5   In centrifugal pump with radial energy of liquid, the manometric efficiencies is given by

   a) $\dfrac{U_2 Vw_2}{gHm}$

   b) $\dfrac{gHm}{U_2 Vw_2}$

   c) $\dfrac{Hm}{gU_2 Vw_2}$

   d) $\dfrac{g U_2 Vw_2}{Hm}$ 2

6 In a centrifugal pump, the local atmospheric pressure is 9.8m of water and vapour pressure is 0.4m (abs), the height of the pump above sump in water level is 5m. If the suction side head loss is 0.6m, the NPSH is
   a) 5.1m
   b) 4.2m
   c) 3.8m
   d) 3.3m   3

7 To generate 10,000 HP under a head of 81m while working at a speed of 500 rpm, the turbine of choice would be
   a) Pelton
   b) Kaplan
   c) Bulb
   d) Francis   3

8 The speed ratio for Pelton turbine is given by

   a) $\dfrac{U}{\sqrt{2gH}}$

   b) $\dfrac{Vf}{\sqrt{2gH}}$

   c) $\dfrac{Vw}{\sqrt{2gH}}$

   d) $\dfrac{\sqrt{2gH}}{U}$ 2

9 The flow rate in a gear pump
   a) Increases with increase in pressure
   b) Decreases with increase in pressure
   c) Remains constant with increase or decrease in pressure
   d) None of the above.   2

10 The minimum absolute pressure occurs at
   a) The beginning of the suction stroke
   b) The end of the suction stroke
   c) The middle of the suction stroke
   d) Both (a) and (b)   2

PART – B (5x10 = 50 Marks)

11 Describe with a neat sketch the layout of a hydraulic power plant.

12 A jet of water coming out of a nozzle of 25 cm^2 with a velocity of 35 m/s strikes to a flat plate inclined at 30° to the axis of the jet. Find the force exerted on the plate normal to the axis of the plate. Also, the ratio of discharge gets divided after striking the plate.

13 a) Differentiate between centrifugal pumps and reciprocating pumps.
   b) Explain the significance of cavitation and its effects in pumps.

14 A centrifugal pump has 30cm and 6 0cm diameters at inlet and outlet. The inlet and outlet vane angles are 30° and 45° respectively. The water enters at a velocity of 2.5 m/s radially. Find the speed of impeller in rpm and the power of the pump if the flow is 0.2 m^3/sec.

15 A Pelton wheel is working under a head of 45m and water supply is 0.8m^3/s. The mean bucket velocity is 14 m/s. Find the over all efficiency and B.P developed by the system, take C$_v$ = 0.985, $_m$ = 95%. The jet is deflected by the bucket through an angle of 165°.

16 Explain why a draft tube is used in a reaction turbine and how the net head is increased with the use of draft tube.

17 a) Explain the construction details of oil reservoir and selection criteria for pumps.
   b) Draw MP characteristic curves for turbines.

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FACULTY OF ENGINEERING

B.E. 3/4 (P) I – Semester (Old) Examination, November / December 2016

Subject: Machine Tool Engineering

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 Derive the expression for shear angle in orthogonal cutting.
2 How are the cutting tools classified? Name a few tools of each type.
3 What are different sources and areas of heat generation during metal cutting?
4 What are craten wear and flank wear?
5 List the various attachments on lathe.
6 What are the methods of gear cutting?
7 Specify lathe.
8 What is adaptive control? Explain.
9 Differentiate Capstan and Turret lathe.
10 Sketch the single point cutting tool and indicate all features.

PART – B (5x10 = 50 Marks)

11 Draw a Merchant's circle diagram and derive expressions to show relationships among the different forces acting on the cutting tool.

12 The following data were recorded while turning a work piece on a lathe
   Cutting speed = 25 m/min
   Feed rate = 0.3 mm/rev
   Depth of cut = 2.0 mm
   Tool life = 100 min.
   If the cutting speed, feed, and depth of cut are all increased by 25% each, and also collectively; what will be their effect on the tool life.

13 a) What is twist drill? Sketch a twist drill and show its different parts on it.
   b) Explain taps and dies, chaser.

14 a) How do you perform simple and differential indexing? In what cases these can be used.
   b) Differentiate between shaper and planer.

15 a) What are the different types of bonds used in the manufacture of abrasive wheels?
   b) What is group technology? What is its relevance in NC and CNC machining?

16 a) Discuss the relative merits of HSS, coated carbides and ceramic tool materials.
   b) Describe the functions of a coolant in metal cutting operations.

17 Write short notes on the following:
   a) Bevel gear cutting
   b) Machinability of materials
   c) Canned cycles.

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FACULTY OF ENGINEERING

B.E. 3/4 (Prod.) I – Semester (Main) Examination, Nov. / Dec. 2016

Subject: Machine Tool Engineering

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 Derive the expression for shear angle in orthogonal cutting.

2 How are the cutting tools classified? Name a few tools of each type.

3 What are different sources and areas of heat generation during metal cutting?

4 What are craten wear and flank wear?

5 List the various operations on lathe.

6 What are the methods of gear cutting?

7 Specify grinding wheel.

8 What is FMS? Explain.

9 Explain method of thread production.

10 Sketch the single point cutting tool and indicate the all features.

PART – B (5x10 = 50 Marks)

11 In orthogonal turning of a 50 mm dia mild steel bar on a lathe the following data were obtained:
   Rake angle = 15°
   Cutting speed = 100 m/min
   Feed = 0.2 mm / rev
   Cutting force = 180 N
   Feed force = 60 N
   Calculate the shear plane angle, coefficient of friction, cutting power, the chip flow velocity and shear force, if the chip thickness = 0.3 mm.

12 The following data were recorded while turning a work piece on a lathe:
   Cutting speed = 25 m/min
   Feed rate = 0.3 mm/rev
   Depth of cut = 2.0 mm
   Tool life = 100 min
   If the cutting speed, feed, and depth of cut are all increased by 25% each, and also collectively; what will be their effect on the tool life.

13 a) What is twist drill? Sketch a twist drill and show its different parts on it.
   b) Explain the methods used for generation of threads in a lathe.

14 a) How do you perform simple and differential indexing? In what cases these can be used.
   b) What are the different methods of gear manufacturing? Give a brief account of each of them.

15 a) What are the different types of bonds used in the manufacture of abrasive wheels?
   b) What is group technology? What is its relevance in NC and CNC machining?

16 a) What is machinability? Discuss role of different machining factors that effect on machinability of work material.
   b) Describe the functions of a coolant in metal cutting operations.

17 Write short notes on the following:
   a) Bevel gear cutting
   b) Built-up edge phenomena
   c) Adaptive control systems.

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FACULTY OF ENGINEERING

B.E. 3/4 (AE) I-Semester (Old) Examination, December 2016

Subject : Automotive Chassis Components

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

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

PART – A (10 x 2 ½ = 25 Marks)

1   Compare integral body construction and semi integral body construction.
2   Sketch the layout of the power flow for a front engine rear wheel drive vehicle and mark the main components.
3   Distinguish dead axle and live axle and Ackerman and Davis steering system.
4   What is a constant velocity universal joint?
5   Draw the sketches of 'Elliot' and 'Reverse Elliot' type of front axle.
6   What are the various types of differential housing?
7   What is the need of shock absorbers in vehicles?
8   What is the necessity of 'spring shackle' in a suspension system?
9   What is meant by bleeding of hydraulic brake?
10 Explain the use of parking brake.

PART – B (50 Marks)

11 Explain about the various types of loads acting on vehicle frame with neat sketches.

12 Define and explain the following with suitable sketches for automotive vehicles.
   i) Camber   ii) Castor   iii) Kingpin inclination

13 Explain with a neat sketch Hotch kiss drive.

14 Explain the following with a neat sketch.
   i) fully floating axle
   ii) three quarter floating axle

15 Write the advantages of independent front suspension system and explain the constructional details of a MC-Pherson strut type suspension.

16 Discuss the importance of anti lock braking system (ABS) for modern vehicle.

17 Write notes on the following :
   i) Drum brakes
   ii) Vacuum assisted brakes
   iii) Torsion bar
   iv) Differential lock

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FACULTY OF ENGINEERING

B.E. 3/4 (AE) I - Semester (New)(Main) Examination, November / December 2016

Subject : Automotive Chassis Components

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 merits of front wheel drive over four wheel drive?   (3)
2 Mention various loads acting on chassis frame.   (2)
3 Describe worm and sector type steering gear box.   (3)
4 Define wheel wobble and its causes.   (2)
5 What is the function of an universal joint? Where it is used in the transmission
   system of an automobile?   (3)
6 Write the purpose of final drive.   (2)
7 What is the need of suspension system in an automobile?   (3)
8 List the advantages of independent suspension.   (2)
9 Classify brakes   (3)
10 What do you mean by bleeding and adjustment of brakes?   (2)

PART – B (50 Marks)

11 Draw the layout details of frame with different types, explain its cross sections. (10)

12 Differentiate Davis and Ackerman's principle of steering. Show with the help
   of a diagram when vehicle takes a right turn.   (10)

13 What is the purpose of a differentiate? Describe the working of three types of
   differential with sketch.   (10)

14 How does torsion bar suspension and telescopic type shock absorber work?
   Explain in brief.   (10)

15 Explain the construction and working of hydraulic brakes with aid of line sketch. (10)

16 What is the function of steering linkage? Describe the working of steering linkage
   for rigid axle suspension.   (10)

17 Explain briefly (i) power steering system   (ii) wish bone suspension system   (10)

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FACULTY OF ENGINEERING

B.E. 3/4 (CSE) I - Semester (Old) Examination, November / December 2016

Subject : Software 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 Why is software Engineering is said to be a layered technology?	(3)
2 What is a core product?	(2)
3 What is Work break down structure?	(3)
4 What is a Gantt chart? Why is it important in software development?	(2)
5 Define Use-case diagram. Explain with an example.	(3)
6 What is Information Hiding?	(2)
7 Are stepwise refinement and factoring the same thing? If not, how do they differ?	(2)
8 Define Coupling. List various types of coupling.	(3)
9 What is function point? How do you compute function points?	(3)
10 What is Regression Testing?	(2)

PART – B (50 Marks)

11 (a) Explain CMMI in detail.   (5)
   (b) What is Agility? Explain XP and ASD models.   (5)

12 (a) Explain in detail about software project planning.   (5)
   (b) What is the purpose of Requirements elicitation? Explain, wow are the different
       stakeholders involved in Requirements Elicitation?   (5)

13 (a) Enumerate the characteristics of a good software design.   (5)
   (b) Explain class-based modeling in detail.   (5)

14 (a) Define software Architecture. Explain the importance of software Architecture in
       software development.   (5)
   (b) What is a Component? Explain how to conduct component-level design.   (5)

15 Explain White-Box Testing in detail.   (10)

16 (a) What is Debugging ? Explain different Debugging approaches.   (5)
   (b) Explain behavioral modeling.   (5)

17 Write short notes on the following:
   (a) Unified Process model   (4)
   (b) Risk Management   (3)
   (c) Alpha and Beta Testing   (3)

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FACULTY OF ENGINEERING

B.E. 3/4 (CSE) I-Semester (New) (Main) Examination, Nov. / Dec. 2016

Subject : Software Engineering

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 is Generic software process?	2
2	What is a Pattern?	3
3	What is work break down structure?	2
4	How can you manage the requirements?	3
5	What is cohesion and coupling?	2
6	Define use-case. Draw a neat use-case diagram for ATM system.	3
7	What is a components?	2
8	What is the process of Evaluating interface design?	3
9	How are verification and validation important individually?	2
10	What is function point? How do you compute function points?	3

PART – B (50 Marks)

11 a) Explain CMMI in detail.   5
  b) What is Agility? Explain extreme programming and crystal process models in
      detail.   5

12 a) Explain about software project planning.   5
  b) What is requirements engineering? List various tasks of requirements
      engineering. Explain about inception in detail.   5

13 a) Explain in detail about class-based modeling approach with an example.   5
  b) Explain the design model.   5

14 Explain the Golden rules performed in user interface design.

15 Explain white box testing in detail.   10

16 a) What is Debugging? Explain different debugging approaches.   5
  b) Define measure, metric. Explain the metrics for testing.   5

17 Write short notes on the following :
  a) Specialized process models   4
  b) Security testing   3
  c) Risk Management   3

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FACULTY OF INFORMATICS

B.E. 3/4 (IT) I - Semester (Old) Examination, November / December 2016
Subject : Operating 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   Define the goals of operating systems.   (2)
2   List and compare the two Interprocess Communication models.   (3)
3   What is Beladys Anomaly?   (2)
4   State the criteria for which any critical section problem solution should satisfy.   (3)
5   Differentiate between paging and segmentation.   (3)
6   State the working set model used to Avoid thrashing.   (2)
7   Define the different RAID levels.   (3)
8   What is a STREAM?   (2)
9   What are the different types of security attacks?   (3)
10 Differentiate between Access control list and capability list.   (2)

PART – B (50 Marks)

11 (a) Describe the functions of Long term, Medium term and short term schedulers
      and list their differences.   (5)
    (b) With the help of a transition diagram explain the different process states.   (5)

12 Given below is a set of processes. Compute for each Average Turnaround time
    and Average Waiting Time using FCFS, SJF (pre emptive), priority (non-pre emptive)
Round – Robin (Time slice = 2) process scheduling method. Draw the Gantt
    chart for each method.   (10)

Process-Id	CPU Burst Time	Arrival Time	Priority Max value = High priority
P1	3	1	1
P2	1	2	3
P3	1	3	4
P4	2	4	2

13 (a) Describe Paging technique and how it avoids external fragmentation.   (5)
    (b) Discuss the different ways of storing the page table.   (5)

14 (a) Explain the different space allocation methods for storing files on disks and the
      type of file access they support.   (6)
    (b) What is a bad block? Describe the techniques to manage disk bad blocks.   (4)

15 (a) Explain the Access Matrix model used to define protection and the various
      operations.   (5)
    (b) Describe how firewall can be used to protect system and network.   (5)

16 (a) Define a safe state. Write and explain how Banker's Algorithm avoids deadlock in
      resource allocation to process requests.   (1+5)
    (b) Write the Peterson solution for 2-process synchronization and explain how it
      satisfies CSP criteria.   (4)

17 Discuss the following: (10)
    (a) DMA
    (b) Monitor as a synchronization tool
    (c) File Control Block

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FACULTY OF INFORMATICS

B.E. 3/4 (IT) I – Semester (New) (Main) Examination, November / December 2016

Subject: Operating 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	State the two goals of an operating System.	2
2	Differentiate between Message Passing and Shared Memory Models used for Interprocess Communication.	3
3	What is Beladys Anamoly?	2
4	Define Critical Section. What are the three Criteria, any critical section problem solution should satisfy?	3
5	Differentiate between FIFO and LRU page replacement algorithms.	2
6	Define Thrashing and how Working Set Model is used to avoid thrashing?	3
7	How is Reliability and Performance improved in RAID?	3
8	What is a STREAM?	2
9	What are the different types of security attacks?	3
10	With example, show how Access Matrix is implemented using Access Control List.	2

PART – B (5x10 = 50 Marks)

11 a) List and compare the various types of schedulers.   5

    b) Define the contents of Process Control Block (PCB) and show the different states of a process.   5

12 For the given set of processes, Compute the Average Turnaround Time and Average Waiting Time using the following techniques. Draw Gantt chart for each.
 i. FCFS   ii. SJF (Preemptive)   iii. Round Robin (Time Slice=2) process scheduling methods.   10

Process id	CPU Burst Time	Arrival Time
P1	4	1
P2	2	2
P3	1	3
P4	3	3

13 a) Explain the Paging technique with a suitable example.   5

    b) List the steps involved to service a page fault.   5

14 a) Explain the different space allocation methods for storing files on disks and the type of file access they support.   6

    b) Describe the methods to handle bad block?   4

15 a) How is protection information implemented using Access Matrix model.   5

    b) Describe firewall mechanism used to protect systems and networks.   5

16 a) Write and explain the Banker's Algorithm used for Deadlock Avoidance.   5

    b) Explain Reader-Writers Problem solution using Semaphores.   5

17 a) Explain Monitor solution for Dining Philosopher Problem.   5

    b) Explain the Layered File System.   5

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