Code No.11531 / CBCS

FACULTY OF ENGINEERING

B.E. (Civil) VI – Semester (CBCS) (Main) Examination, May / June 2019

Subject: Soil Mechanics

Time: 3 Hours **Max.Marks: 70**

Note: Answer all questions form Part-A and any five questions from Part-B

PART – A (10x2 = 20 Marks)

1 Define (a) Specific gravity (b) Void ratio (c) Degree of saturation
2 Establish the relationship between degree of saturation soil moisture content, specific gravity and void ratio
3 What is Darcy's law? What are its limitations?
4 What is the form of energy transferred to the soil when a sheep's foot roller is used? In which type of soils it is more effective?
5 The capillary rise in a soil A with an effective size of 0.002mm was 60cm.Estimate the capillary rise in a similar soil with an effective size of 0.04mm
6 Define:
   i) Coefficient of compressibility
   ii) Compression index
7 The time required for a Consolidating medium with single drainage to undergo 50% of its primary consolidation settlement was estimated as 32yrs, all the conditions remaining same estimate the time required if the medium has double drainage?
8 A cohesionless soil failed at a deviator stress of 60Kpa when cell pressure was 40kpa Determine Shear parameters c,Ø
9 Distinguish between active and passive earth pressure
10 What is Stability number? What is its utility in analysis of slopes?

PART – B (5x10 = 50 Marks)

11.a) Derive $\gamma = \frac{(G + Se)\gamma_w}{1 + e}$ 5M

b) Explain briefly Indian standard soil classification. 5M

12 a) Develop an equation for determining the rise of water in a capillary tube. Also write the representative heights of capillary rise (m) in different types of soils. 5M

b) A sand deposit is 10m thick and overlies abed of soft clay .The ground water table is 3m below ground surface .if the sand above ground water table has a degree of saturation of 45% plot the diagram showing the variation of total stress, pore water pressure and the effective stress. The void ratio of the sand is 0.70 and G= 2.65. 5M

13 a) What is "relative compaction"? Explain the procedure to determine it. 5M

b) A standard proctor test was carried out and the following values were recorded. The volume of mould is 945cc.plot the dry density Vs moisture content curve and hence find optimum moisture content and maximum dry density. 5M

Water content (%)	17.5	19.0	20.0	20.8	21.8	22.4	24.2
Mass of soil weight (gm)	1772	1837	1860	1871	1906	1865	1850

..2

14 a) What do you understand on normally consolidated and over consolidated soils. 5M

b) A soil sample has a compression index of 0.30.If the void ratio e at stress of 1.40kg/m^2 is 0.50.compute the (i) void ratio if stress is increased to 2 kg/m^2 and (ii) settlement of soil stratum 4m thick. 5M

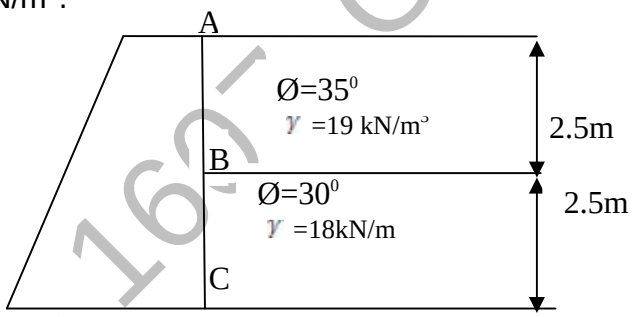
15 a) Explain the factors affecting shear strength of cohesive soils. 5M

b) The following results were obtained from a consolidated–undrained (CU) test on normally consolidated clay. Plot the strength envelope in terms of total stresses and effective stresses and determine strength parameters. 5M

sample	Cell pressure	Deviator stress	Water pore pressure
1	250	152	120
2	500	300	250
3	750	455	350

16 a) Explain the major differences between Rankine's and coulombs theories of lateral earth pressures. 5M

b) Determine the lateral earth pressure at rest per unit length of wall shown below. also determine the Location of the resultant earth pressure. K_o = 1- sin Ø and γ_w = 10KN/m^3. 5M



17 Write a detailed note on any two of the following: 2x5=10

a) Procedure for determination of "Plasticity index"
b) Variable head permeability test
c) Vane shear test
d) Swedish slip circle method.

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Code No: 11574/CBCS

FACULTY OF ENGINEERING

B.E.VI – Semester (Mech.) (CBCS) (Main) Examination, May/June 2019

Subject: Automobile Engineering

Time : 3 Hours **Max. Marks: 70**

Note: Answer all the questions from Part – A & any five questions from Part-B.

PART – A (20 Marks)

1. Classify the types of automobiles with respect to
   (a) Wheel and axel (b) transmission
2. What are the functions of cylinder liners?
3. What is the function of a supercharger?
4. What are the different types of lubricants used in automobiles?
5. What is the importance of maintaining tyre pressure?
6. What is Toe-in and Toe-out on turns? Explain its purpose.
7. What are the requirements of an automatic transmission system?
8. What is the function of pressure plate in clutches?
9. What is the need of pollution control?
10. List out the tools required for repair and haul of automobiles.

PART – B (50 Marks)

11. Compare the merits and demerits of a frameless construction with those of the conventional frames in automobiles.
12. Explain in detail the working of a radiator cooling system.
13. What is a three-way catalytic convertor? Explain its working principle.
14. Describe about the wish-bone suspension system, its advantages and disadvantages.
15. Explain the single plate and multi-plate clutch system with neat diagram.
16. Write in detail about the hand brake system.
17. Explain the general servicing and over-haul procedure of automobiles.

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Code No. 11125/BL

FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II-Semester (Backlog) Examination, May / June 2019

Subject : Soil Mechanics

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 specific gravity of soil solids. 2

2 Between clay and sand which is more porous and which is more permeable. 2

3 What is the critical hydraulic gradient for a soil of specific gravity G = 2.7 and void ratio, e = 0.70? 2

4 Differentiate “Discharge velocity” and “Seepage velocity”. 2

5 Define coefficient of compressibility and coefficient of volume change. 2

6 Differentiate compaction and consolidation. Give examples. 3

7 The unconfined compression test is suitable for cohesive soils only. Answer ‘Yes’ or ‘No’ and justify. 3

8 A cohesionless soil sample failed at a deviatoric stress of 80 kPA. When the cell pressure was 50 kPa. Determine the shear parameters. 3

9 What are different types of slope failures? 3

10 Determine the depth of tension crack developed in a cohesive soil having c = 40 KPa and γ = 20 kN/cu.m. 3

PART – B (50 Marks)

11 a) Explain the laboratory procedure for determination of shrinkage limit and derive the expression for it. 5

b) The following data was recorded in a core cutter method at a site. Empty weight of the core samples = 1150 gm, weight of core t In-situ moist soil = 3220 gm, volume of the samples = 945cc, In-situ moisture content = 9.6%, specific gravity of solids = 2.64. Determine i) void ratio ii) Degree of saturation iii) Dry density iv) Saturation density v) Density index if maximum and minimum void ratio’s are 1.10 and 0.21. 5

..2

12 a) What are the methods used to find out permeability in lab and in field? Explain any one of the methods. 5

b) A flow net consists of 9 flow lines and 16 equi potential lines. The total head causing flow is 12m. The average size of any field is 0.8m. However, the minimum size of any field at downstream end is 0.6m. The average permeability of soil is given as 3.6×10^{-3} cm/sec, calculate i) The discharge of seepage flow ii) the exit gradient. 5

13 a) Discuss Terzaghi's theory of consolidation, stating the various assumptions and their validity. 5

b) The wet weight of a sample is missing in a proctor test. The over dry weight of this sample is 189N. The volume of the mould used is 1000 cm^3. If the degree of saturation of this sample is 90%, determine its water content and bulk density. Take G = 2.7. 5

14 a) Explain the "Triamial shear test" and state its merits and demerits. 5

b) A Series of shear tests was performed on a soil. Each test was carried out until the soil sample sheared and the principal stresses for each test are as follows.

Test	Minor stress (Kn/m^2)	Major stress (kN/m^2)
1	300	875
2	400	1160
3	500	1460

Plot the Mohr's circle of stress and determine the strength envelope and angle of internal friction of the soil. 5

15 a) Explain in detail Taylor's stability number. 5

b) A 9m high retaining wall with a vertical face is supporting a backfill with horizontal top consisting of two types of soils. The water table is located at a depth of 5m below the top. The properties of soil from 0 to 3m include c = 0, $\Phi = 33^0$, γ = 17 kN/cu.m and those for soil from 3m to 9m include c = 0, $\Phi = 40^0$, γ = 18.5 kN/cu.m, γ_{sub} = 20.5 kN/cu.m. Plot the distribution of passive earth pressure and determine the magnitude and point of action of total passive earth pressure acting on the retaining wall. 5

16 a) Discuss field identification methods for soils. 5

b) Determine the neutral and effective stress at a depth of 16m below the ground level for the following conditions :
Water table is 3m below ground level, G = 2.68, e = 0.72, average water content of the soil above water table is 8%. 5

17 a) A 6m thick fully saturated compressible clay medium with an average initial effective over burden pressure of 9 kPa is undergoing consolidation process to an increment of 60 kPa. Determine the total primary consolidation settlement if e_0 = 1.10, PL = 36%, PI = 44. 5

b) Write short notes on Rebhan's graphical solution. 5

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CODE NO: 11131/BL

FACULTY OF ENGINEERING

BE 3/4 (EEE) II-Semester (Backlog) Examination, May / June 2019

Subject: Digital Signal Processing

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 Linear Time Invariant and Time variant systems. 2

2 What is the condition for stability? 3

3 Distinguish between linear convolution and circular convolution. 3

4 Mention the four properties of DFT 2

5 Find the Z-Transform of the sequence $x(n)=\left(\frac{1}{3}\right)^{n-1} 4(n-1)$ 2

6 Find the system function and the impulse response of the system described by difference equation y(n)=x(n)+2x(n-1)-4x(n-2)+x(n-3) 3

7 What is the procedure to evaluate Impulse Invariant transformation? 3

8 Compare Butterworth and Chebyshev Type-I filters 3

9 List out to various window techniques? 2

10 Mention the need for employing window technique in FIR filter design. 2

PART- B (50 Marks)

11 a) Determine wether the systems described by difference equations below are causal or non-causal? 5

i) $y(n)= x(n)+x^2(n-1)$

ii) $y(n)= x(2n)$

iii) $y(n)= x(n+1)+3\, x(n)+5\, x(n-1)$

b) Determine wether the systems described by difference equations below are Time Invariant or Time variant ? 5

i) $y(n)= x(2n)$

ii) $y(n)= x(n)+nx(n+1)$

12 i) Compute DFT & IDFT of the sequence x(n)= {1,1,1,1,1,1,1,1 } 10

13 Find X(K),for the sequence x(n)= {1,0,1,1,1,0,1,0 } using (DIT) FFT Algorithm 10

14 a) Compute the response of the system y(n)=0.7y(n-1)-0.12y(n-2)+x(n-1)+x(n-2) to input x(n)=n.u(n) 5

b) Realize the following system function using minimum number of multipliers 5

$$H(z)=1+\frac{1}{3}Z^{-1}+\frac{1}{4}Z^{-2}+\frac{1}{4}z^{-3}+\frac{1}{3}z^{-4}+z^{-5}$$

…2

15 Design a Chebyshev filter for the following specifications using impulse invariance technique 10

$$0.8 \leq |H(e^{j\omega})| \leq 1 \quad \text{for} \quad 0 \leq \omega \leq 0.2\pi$$

$$|H(e^{j\omega})| \leq 0.2 \quad \text{for} \quad 0.6\pi \leq \omega \leq \pi$$

16 Design an ideal low pass FIR filter with frequency response 10

$H_d(e^{j\omega}) = 1$ for $-\pi/2 \leq \omega \leq \pi/2$

$= 0$ for $\pi/2 \leq |\omega| \leq \pi$

Find the values of h(n) for N=7 and also H(z) using Rectangular Window

17 i) Draw the architecture of TMS 320C54X DSP Processor 7

ii) Mention the applications of DSP 3

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Code No. 11135/BL

FACULTY OF ENGINEERING

BE 3/4 (Inst.) II Semester (Backlog) Examination, May / June 2019

Subject: Digital Signal Processing

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 Linear Time Invariant and Time variant systems.	2
2	Derive the expression for condition for stability?	3
3	Distinguish between linear convolution and circular convolution.	3
4	What is meant by zero padding?	2
5	Write short notes on Impulse Invariant transformation?	3
6	Compare Butterworth and Chebyshev Type-I filter.	3
7	What is the reason that FIR filter is always stable?	2
8	What is the necessary and sufficient condition for linear phase characteristic in FIR filters?	2
9	What is pipelining? What are the different phases in pipelining?	3
10	What is the function of parallel logic unit?	2

PART – B (5x10 = 50 Marks)

11 a) Determine wether the systems described by difference equations below are causal or non-causal? 3
   i) $y(n)= x(n)+x^2(n-1)$
   ii) $y(n)= x(2n)$
   iii) $y(n)= x(n+1)+3\ x(n)+5\ x(n-1)$

   b) Determine wether the systems described by difference equations below are Time Invariant or Time variant? 3
   i) $y(n)= x(2n)$
   ii) $y(n)= x(n)+nx(n+1)$

   c) Determine whether the systems described by difference equations below are Static or dynamic. 2
   i) $y(n)=x(n)x(n-1)$
   ii) $y(n)=x^2(n)+x(n)$

   d) Determine wether the systems described by difference equations below are Stable or unstable. 2
   i) $y(n)=x(n)u(n)$
   ii) $y(n)=ax(n)+b$

12 Compute DFT of the sequence $x(n)= \{1,1,1,1,1,1,1,1\}$ 10

13 Find X(K),for the sequence $x(n)= \{1,0,1,1,1,0,1,0\}$ using the Decimation-in- Frequency (DIF) FFT Algorithm 10

..2

14 a) Compute the response of the system 5

y(n)=0.7y(n-1)-0.12y(n-2)+x(n-1)+x(n-2) to input x(n)=nu(n)

b) Realise the following system function using minimum number of multipliers 5

$H(Z)=1=1/3Z^{-1}+1/4Z^{-2}+1/4Z^{-3}+1/3Z^{-4}+Z^{-5}$

15 Design a Chebyshev filter for the following specifications using impulse invariance technique. 10

$$\left| H(e^{j\omega}) \right| \leq 0.2 \quad \text{for} \quad 0.6\pi \leq \omega \leq \pi$$

16 Using a rectangular window technique, design a low pass filter With pass band gain of unity, cut off frequency of 1000Hz and working at a sampling rate of 5 KHz. The length of impulse response should be 7. 10

17 Explain how DSP algorithms can be implemented on general purpose DSPs. 10

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Code No. 11613/O

FACULTY OF ENGINEERING

BE 3/4 (Ins.) II Semester (Old) Examination, May / June 2019

Subject: Digital Signal Processing & Applications

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 Linear Time Invariant and Time variant systems.	2
2	Derive the expression for condition for stability?	3
3	Find the DFT of the signals i) $x(n)=\delta(n)$ ii) $x(n)= a^n$	3
4	Mention the four properties of DFT	2
5	What is warping effect? What is its effect on magnitude and phase response?	3
6	Write short notes on Impulse Invariant transformation?	3
7	Compare various window techniques?	2
8	Mention the need for employing window technique in FIR filter design.	2
9	What is pipelining? What are the different phases in pipelining?	3
10	What are the factors that influence the selection of DSPs?	2

PART – B (5x10 = 50 Marks)

11 a) Determine whether the systems described by difference equations below are causal or non-causal? 3
   i) $y(n)= x(n)+x^2(n-1)$
   ii) $y(n)= x(2n)$
   iii) $y(n)= x(n+1)+3\ x(n)+5\ x(n-1)$

   b) Determine whether the systems described by difference equations below are Time Invariant or Time variant ? 3
   i) $y(n)= x(2n)$
   ii) $y(n)= x(n)+nx(n+1)$

   c) Determine whether the systems described by difference equations below are Static or dynamic? 2
   i) (n)=x(n)x(n-1)
   ii) $y(n)=x^2(n)+x(n)$

   d) Determine whether the systems described by difference equations below are Stable or unstable. 2
   i) $y(n)=x(n)u(n)$
   ii) $y(n)=ax(n)+b$

12 Compute DFT of the sequence 10
   $x(n)= \{1,1,1,1,0,0,0,0\}$

13 Find X(K),for the sequence $x(n)=\{1,0,1,1,1,0,1,0\}$ using the Decimation-in-Time (DIT) FFT Algorithm. 10

14 a) Obtain the Direct Form-II realisation for the following system 5

$$H(Z) = \frac{\left[1+\frac{1}{4}Z^{-1}\right]}{\left[1+\frac{1}{2}Z^{-1}\right]\left[1+\frac{1}{2}Z^{-1}+\frac{1}{4}Z^{-2}\right]}$$

b) Realise the following system function using minimum number of multipliers 5

$H(Z)=1=1/3Z^{-1}+1/4Z^{-2}+1/4Z^{-3}+1/3Z^{-4}+Z^{-5}$

15 Design a Chebyshev filter for the following specifications using impulse invariant transformation. 10

$0.8 \leq |H(e^{j\omega})| \leq 1$ for $0 \leq \omega \leq 0.2\pi$

$|H(e^{j\omega})| \leq 0.2$ for $0.6\pi \leq \omega \leq \pi$

16 Design an ideal low pass FIR filter with frequency response 10

$H_d(e^{j\omega})= 1$ for $-\pi/2 \leq \omega \leq \pi/2$

$=0$ for $\pi/2 \leq |\omega| \leq \pi$

Find the values of h(n) for N=7 and also H(z) using Rectangular Window.

17 Explain in detail about implementation of DSP algorithms on general purpose DSP? 10

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Code No. 11140 / BL

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) II - Semester (Backlog) Examination, May / June 2019

Subject : Digital 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 State the sampling theorem for band pass signals. 2

2 Define Shannon channel capacity theorem. 2

3 What is the necessity of error correction codes? 2

4 Explain prediction theory. 3

5 Define the terms a) amount of information b) entropy c) information rate 3

6 Define processing gain of DSSS system. 2

7 A source generates four messages m_0, m_1, m_2, m_3 with probabilities of 1/4, 1/8 1/8, 1/2 respectively. Calculate entropy of the source. 2

8 Compare the digital modulation schemes ASK. PSK, FSK interms of power and bandwidth. 3

9 Draw inter symbol interference and write its significance. 3

10 Differentiate linear block code and convolution code. 3

PART – B (50 Marks)

11 a) Explain working of a DM with neat diagram. 5
b) Derive the expression for quantization error in delta modulation. 5

12 a) Describe Mutual information. 4
b) A source generates 5 messages with probabilities of $m_0 = 0.55$, $m_1 = 0.15$, $m_2 = 0.15$, $m_3 = 0.10$ and $m_4 = 0.05$.
Using Huffman's coding find the efficiency of the source code. 6

13 The generator matric of (7, 4) linear block code is

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

Find all the code words, minimum weight and minimum distance. 10

..2

14 a) With neat diagram, explain coherent reception of BPSK signal. 5
b) Derive the expression for the probability of error of the matched filter. 5

15 A rate 1/3 convolution encoder has generating vectors as $g_1 = (100)$, $g_2 = (111)$, and $g_3 = (101)$ 10
i) Sketch the encoder configuration
ii) Draw the code tree, state diagram and trellis diagram
iii) If the input message sequence is 10110 determine the output sequence of the encoder.

16 a) With neat diagram, explain direct sequence spread spectrum technique. 5
b) In a DS/BPSK system the feedback register used to generate PN sequence has the length of m = 15. The system is required to have an average probability of symbol error less than 10^{-5}. Calculate processing gained and Jamming margin for the system. 5

17 Write short notes on : 10
a) Code tree
b) Difference between slow frequency hopping and fast frequency hopping
c) DPCM transmitter

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Code No: 11144/BL

FACULTY OF ENGINEERING

B.E. ¾ (M/P) II - Semester (Backlog) Examination, May / June 2019

Subject: Machine Design

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. Explain the following terms with neat sketches
   a) Solid Length b) Free Length
2. State the reasons of NIPPING of spring.
3. Write short notes on gear drives giving their merits and demerits?
4. When do we use worm gears?
5. Specify the merits of rolling contact bearing over sliding contact bearing.
6. What is lubricant and why is it employed?
7. Mention the various types of stresses induced in the connecting rod?
8. How do you design the Piston Head?
9. What type of cross section is preferred for a crane hook? And why?
10. State four salient features of curved beam design application.

PART – B (5 x 10 = 50 Marks)

11. A composite spring has two closed coiled helical springs. The outer spring is 15 mm larger than the inner spring. The outer spring has10 coils of mean diameter 40 mm and wire diameter 5 mm. The inner spring has 8 coils of mean diameter 30mm and wire diameter 4 mm. When the spring is subjected to an axial load of 400 N. Find 1. Compression of each spring 2. Load shared by each spring 3. Shear stress induced in each spring. The modulus of rigidity may be taken as 84 KN/mm^2.
12. Spur gears are to transmit 20 KW when the pinion rotates 300 r.p.m. The velocity ratio is 1:3. The allowable static stresses for the pinion and gear materials are 120 MPa and 100 MPa respectively. The pinion has 15 teeth and its face width is 14 times the module. Determine the module and face width. Taking into consideration of the dynamic loading. The tooth form factor y can be taken as

$$y = 0.154 - \frac{0.912}{No.of\ teeth} \qquad \text{Velocity factor } C_v = \frac{3}{3+v}$$

where V is the pitch line velocity in m/S

13. A full journal bearing of 100 mm diameter diameter and 90 mm long runs at 250 r.p.m.

Contd…2..

The bearing supports a load of 28kN. If the ratio of the diametral clearance to the diameter is 0.001. The absolute viscosity of the oil is 0.015Kg/m-sec. Find the coefficient of friction and heat generated at the bearing due to friction.

14. Design a connecting rod for an I.C. engine at 1800 r.p.m. and developing a maximum pressure of 3.15 N/mm^2. The diameter of the piston is 100 mm: mass of the reciprocating parts of 2025 kg: length of connecting rod 380: stroke of piston 190 mm and compression ratio 6:1. Take factor of safety of 6 for the design. Take length to diameter ratio of big end bearing as 1.3 and small end bearing as 2 and corresponding bearing pressure as 10 N/mm^2 and 15 N/mm^2. The density of material of the rod may be taken as 8000 Kg/m^3 and the allowable stress in the bolts as 60 N/mm^2 and in cap as 80 N/mm^2. The rod is to be of I-section for which you can choose your own proportions. Draw a neat dimensional sketch showing provision for lubrication. Use rankine formula for which the numerator constant may be taken as 320 N/mm^2 and the denominator constant 1/7500.
15. Find the load carrying capacity of a trapezoidal cross sectioned crane hook. The radius curvature of the inner fiber is 50 mm. Yield strength of the material is 250 Mp a. Use factor of safety of 2 and Choose suitable dimensions of the section.
16. A truck spring has 12 numbers of leaves, two of which are full length leaves. The spring supports are 1.05 m apart and the central band is 85 mm wide. The central band is to be 5.4 kN with a permissible stress for full length leaves is 280 MP a. Determine the thickness and width of the steel spring leaves is 280 MP a. The ratio of the total depth to the width of the spring is 3. Also determine the deflection of the spring.
17. Write short notes on

    i) Bevel gears

    ii) Life of rolling contact bearing

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Code No. 11153/BL

FACULTY OF ENGINEERING

BE 3/4 (A.E) II Semester (Backlog) Examination, May / June 2019

Subject: Design of Automotive Components

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

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

PART – A (25 Marks)

1 Why I-Section is preferred for the design of connecting rod?
2 Why the area of the inlet valve port is made larger then the area of exhaust valve port in an IC engine.
3 What re the functions of a valve spring in an IC engine?
4 Briefly discuss the importance of A.M Wahl's factor in the design of helical springs.
5 What an antifriction bearing?
6 What will happen when the viscosity of the lubricant is very low in a bearing?
7 What is Tredgold's approximation in bevel gears?
8 Define silent chain?
9 What is crowning in pulley's?
10 What is Hotchkiss drive?

PART – B (50 Marks)

11 Design the connecting rod for a petrol engine form the following data: Diameter of the piston =110 mm, Mass of the reciprocating parts = 2 kg, Length of the connecting rod = 325 mm, Stroke length = 150 mm, Speed = 1500rpm with possible over speed of 2500 rpm, Compression ratio = 4, Maximum explosion pressure = 2.5 N/mm^2.

12 A helical compression spring is used to absorb the shock. The initial compression of the spring is 30mm, and it is further compressed by 50mm while absorbing the shock. The spring is to absorb 250kJ of energy during the process. The spring index can be taken as 6. The spring is made of patented and cold drawn steel wire with an ultimate tensile strength of 1500 N/mm^2 and modulus of rigidity of 81370 N/mm^2. The permissible shear stress for the spring wire should be taken as 30% of the ultimate tensile strength. Design the spring and calculate. (i) Write diameter (ii) Mean coil Diameter (iii) Number of active turns (iv) Free length (v) Pitch of turns.

13 A semi elliptical laminated spring is to carry a load of 5000 N and consists 8 leaves 46 mm wide, two of the leaves being of full length. The spring is to be made 1000mm between the eyes and is held at the centre by a 60mm wide band. Assume that the spring is initially stressed so as to induce an equal stress of 500 N/mm^2 when fully loaded. Design the spring giving (a) Thickness of leaves (b) Eye diameter (c) Length of leaves (d) Maximum deflection and camber. Assume $E=2.1x10^6$ N/mm^2.

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14 A full journal bearing of 50 mm diameter and 100 mm long has a bearing pressure of 1.5 N/mm2. The speed of the journal is 1000 r.p.m. and the ratio of journal diameter to the diametral clearance is 1000. The bearing is lubricated with oil whose absolute viscosity at the operating temperature of 75^{o}C may be taken as 0.011 kg/m-s. The room temperature is 35^{o}C. Find: (i) The amount of artificial cooling required, and (ii) The mass of the lubricating oil required, if the difference between the outlet and inlet temperature of the oil is 12^{o}C. Take specific heat of the oil as 1900 J/kg/^{o}C.

15 A ball bearing is operating on a work cycle consists of three parts as follows: A radial load of 3000N at 1440 rpm for one quarter cycle, a radial load of 5000N at 720 rpm for one half cycle and radial load of 2500N at 1440 rpm for the remaining cycle. The expected life of the bearing is 10000hrs. Calculate the dynamic load carrying capacity of the bearing.

16 A pair of 20^{o} Involute straight tooth spur gears to transmit 50kW and reduce the speed from 720 rpm to 180 rpm. The pinion and gear are made from phosphor bronze and cast steel with allowable static stresses 50 N/mm^2 and 70 N/mm^2 respectively. Assuming medium shock conditions design drive completely.

17 Write short note on
(a) Ray-diagram of a gear box.
(b) Speed reducers in gear box.
(c) Preventive measures to avoid gear tooth failure.

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Code No: 11160/BL

FACULTY OF ENGINEERING

BE 3/4 (CSE) II – Semester (Backlog) Examination, May / June 2019

Subject: Computer Networks

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

Note: Answer All Questions From Part - A, & Any Five Questions From Part – B.

PART – A (25 MARKS)

1. State the Optimality Principle. 2
2. Explain the use of Choke packets in Hop-by-Hop Backpressure approach. 3
3. Show Transparent and Non-Transparent Fragmentation with the aid of a diagram. 3
4. List the different IPv4 Address Classes. 2
5. State the different timers used in TCP. 3
6. Show the UDP header and its fields. 2
7. Describe DNS Resource Records. 3
8. List the different MIME content types and subtypes. 2
9. List the elementary socket system calls used in Connection-oriented communication. 3
10. Define the purpose of Reserved ports. 2

PART – B (50 MARKS)

11. a) Compare ISO-OSI Reference Model and TCP/IP Reference Model in terms of functions of layers and differences between the two. 7
    b) Explain Reverse Path Forwarding Broadcast routing algorithm with example. 3
12. a) Differentiate between the two types of Packet Fragmentation. 5
    b) Explain Border Gateway Protocol. 5
13. a) Explain Crash Recovery in Transport Layer. 5
    b) Describe TCP Connection Establishment. 5
14. a) Explain about DNS Name Servers and DNS Name Resolution. 5
    b) Describe SMTP used in E-Mail. 5
15. a) Describe about the following Advanced Socket System Calls.
    i) readv and writev ii) getsockopt and setsockopt (any 2 options) iii. select
    b) Show the steps executed by Internet Super Server with a neat flowchart. 4
16. a) Explain Distance Vector Routing Algorithm with a suitable example. 5
    b) Describe TCP Transmission Policy. 5
17. Write short notes on any Two. (2 x 5)
    i. ARP ii. DHCP iii. ICMP

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Code No. 11162/BL

FACULTY OF ENGINEERING

B.E. (I.T.) 3/4 II – Semester (Backlog) Examination, May / June 2019

Subject : Computer Networks

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

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

PART – A (25 Marks)

1	List the uses of Computer Networks.	(2)
2	What are the Quality of Service parameters?	(3)
3	What do you mean by tunneling?	(2)
4	What is UDP? Give any two applications of UDP.	(3)
5	What is Out-of-Band data?	(2)
6	Define daemon process. List common daemons.	(3)
7	Differentiate between static and dynamic documents.	(3)
8	What are the advantages of IP telephony over PSTN?	(3)
9	What is the role of name servers?	(2)
10	Distinguish between symmetric and asymmetric key cryptography.	(2)

PART – B (50 Marks)

11	(a) Describe ISO-OSI model.	(6)
	(b) Explain about the HOP-by-HOP choke packets.	(4)
12	(a) Compare virtual circuit and datagram subnets.	(4)
	(b) What is Inter Domain Routing? Explain OSPF protocol.	(6)
13	Discuss elementary and advanced socket system call.	(10)
14	(a) Describe e-mail architecture and services.	(5)
	(b) Explain TCP timer management.	(5)
15	(a) Explain DES with the help of neat sketch.	(6)
	(b) Discuss SSL in brief.	(4)
16	(a) Draw IPv6 header and explain each field.	(5)
	(b) Explain about Real-time Transport protocol (RTP).	(5)
17	Write short notes on the following:	
	(a) Internet Super Server	(3)
	(b) Firewall	(4)
	(c) Key Distribution center	(3)

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