

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.

QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.

(4*3=12)

- What do you understand by tolerance? Classify it
- What is the metrology. What is the need of metrology in industry.
- Draw a diagram of Hole and Shaft, showing all the terminology used in metrology.
- What is the minimum metal condition, explain with the diagram.
- The outside diameter of bush is turned using a mandrel. The mandrel diameter is maintained as $30^{+0.000}_{-0.050}$ mm and the bore diameter is $30^{+0.000}_{-0.020}$ mm. Find out the maximum value in mm of the eccentricity on the bush due to locating mandrel.

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

- Draw the diagram of micrometer and also write the advantages of micrometer.
- What is interferometer? Explain the principal of interferometer.
- What is the mechanical comparator?
- What is the maximum interference in mm after assembly between a bush of size $30.00^{+0.06}_{+0.03}$ and a shaft of size $30.00^{+0.04}_{-0.02}$.

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

- Write design principles of Clamping of jig and fixture.
- What are the various ways in which presses can be classified?
- Differentiate between blanking die and piercing die.
- Compare open and close die forging.

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

- What is the need of forecasting? Explain the type of forecasting.
- What is material requirement planning? Explain the benefits of MRP.
- There are two products P and Q with the following characteristics. Find the EOQ of products P and Q in ration.

Product	Demand (Units)	Order Cost (Rs/order)	Holding Cost (Rs. Unit/year)
P	1000	150	4
Q	4000	150	1

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

- Solve the following assignment problem for minimum optimal cost.

		To City					
		1	2	3	4	5	6
From City	A	12	10	15	22	18	8
	B	10	18	25	15	16	12
	C	11	10	3	8	5	9
	D	6	14	10	13	13	12
	E	8	12	11	7	13	10

- A self service store employs one cashier at its counter. Nine customers arrive on an average every 5 minutes while the cashier can serve 10 customers in 5 minutes. Assuming poisson distribution for arrival rate and exponential distribution for service time, find:-
 - Avg. number of customers in the system
 - Avg. numbers of customers in the queue
 - Avg. time a customer spend in the system
 - Avg. time a customer waits before being served.
- Determine an initial basic feasible solution to the following transportation problem using voggel's approximation method.

		To					Available
		3	4	6	8	9	20
From	2	10	1	5	8		30
	7	11	20	40	3		15
	2	1	9	14	16		13
Demand		40	6	8	18	6	

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NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.

QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.

(4*3M=12M)

- Define the term Language.
- What do you mean by Semantics?
- Define Phonology.
- What do you understand by Allomorph.
- Meaning of Morphs is _____
- Define Morpheme.

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4M=12M)

- Distinguish between a morpheme and an allomorph.
- Explain denotative and connotative meanings.
- Differentiate between traditional grammar and modern linguistics.
- Name the various speech organs.

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6M=18M)

- Name the three branches of Phonetics.
- Differentiate between language and linguistics.
- What is Syntax? Discuss various levels of linguistic structures.
- Write Short notes on any three- i) Syllable, ii) IPA, iii) RP, iv) Morphology

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7M=14M)

- Describe the nature of Language.
- What are the various fundamental semantic concepts and compositionality?
- Fill in the blanks:
 - Antonym of active _____
 - Antonym of ability _____
 - Synonym of Punctual _____
 - Synonym of technical _____
 - Homonym of hair _____
 - Give an example of homophone _____
 - Give homophone of match _____

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7M=14M)

- Comment on characteristics and significance of language in human life.
- Discuss various functions of a language.
 - Add suffix to make a new word: a)-full, b)-tion, c)-less
 - Add prefix to make a new word: a) Non-, b) Un-, c) Il-, d) Dis-

Enrollment No.

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B.TECH. (ME)

3RD YEAR, 6TH SEMESTER EXAMINATION
DESIGN OF MACHINE ELEMENTS

Time: 3:00 Hrs.

Max. Marks:70

NOTE:- ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.

QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.

(4*3=12)

- State the type of failure in static load
- What are type of dynamic loads?
- Define endurance strength
- Define Notch sensitivity factor
- What is hydrodynamic lubrication bearing?
- What is Pressure angle in case of gear.

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

- What are standard tooth profiles of gear?
- Enumerate the difference between spur gear and Helical gear
- List design needs and requirements
- Discuss brittle material under dynamic loading.

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

- State the causes of stress concentration and remedies to avoid them
- Define notch sensitivity and notch sensitivity factor
- Derive module on the basis of beam strength
- Derive the equation $T_1/T_2 = e^{\mu\theta}$ in belt drive where symbols have their usual meaning.

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

- In a two spur gear diameter of pinion is 120mm and that of gear is 600mm module is 5mm . Determine the no of teeth on both gear and pinion and the circular pitch and diametral pitch.
- A machine component($S_{ut}=600\text{MPa}$) subjected to a dynamic load of (+50kN) in axial loading. The corrected endurance strength is 300MPa. Determine the factor safety of the material of diameter 20mm for load cycle of 10^4 .
- A machine component with $S_{ut}=600\text{MPa}$ with corrected endurance limit **270 MPa** is subjected to a fluctuating stress of 100MPa and 20 MPa .Determine the factor of safety in Soderberg's line , Goodman's line and Gerber's parabola. (Infinite cycle design)

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

- Discuss Buckingham's wear Strength Equation and derive module on wear strength basis.
- In a spur gear transmitting 5kW power at a speed of 750RPM has pinion pitch circle diameter of 120mm and the gear material is having ultimate tensile strength of 550MPa. Design the gear.
- Derive the total length Equation of Chain Drive.

Enrollment No.

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B.TECH (ME)
3RD YEAR, 6TH SEMESTER EXAMINATION
I.C. ENGINE

Time: 1.30 hours

Max. Mark: 70

NOTE: - ATTEMPT ALL THE QUESTIONS AS PER GIVEN INSTRUCTIONS.**QUESTION NO.-1: ATTEMPT ANY FOUR PARTS.**

(4*3=12)

- Differentiate between four stroke and two stroke engines?
- Compare the SI and CI engine?
- Explain flame speed.
- State stoichiometric Air Fuel ratio.
- What are turbochargers?

QUESTION NO.-2: ATTEMPT ANY THREE PARTS.

(3*4=12)

- Explain the working of four stroke spark ignition engine?
- Sketch the Diesel cycle on p-v and T-s diagram.
- Compare Otto, Diesel and Dual cycle for the
 - Same compression ratio and heat input.
 - Same peak pressure and heat input.
- Describe MPFI system with the help of neat sketch.

QUESTION NO.-3: ATTEMPT ANY THREE PARTS.

(3*6=18)

- Explain normal and abnormal combustion in SI engine.
- Sketch some important designs of open combustion chamber for CI engines.
- Explain the working of simple carburetor.
- What do you mean by blow by measurement?

QUESTION NO.-4: ATTEMPT ANY TWO PARTS.

(2*7=14)

- Derive an expression for air standard efficiency of Otto cycle in terms of compression ratio.
- Use the initial conditions for an air standard Diesel cycle operating with a compression ratio of 15:1 are 0.95 bar and 17°C. The heat added is 1800 kJ/kg. Solve the pressure and temperature at the end of each process of the cycle, also determine thermal efficiency and mean effective pressure of the cycle.
- Compare knocking phenomenon in SI and CI engines.

QUESTION NO.-5: ATTEMPT ANY TWO PARTS.

(2*7=14)

- Use data of a 4 cylinder. 4 stroke petrol engine. Air/fuel ratio by weight 16:1, Calorific value of the fuel is 45200 KJ/Kg. Mechanical efficiency 82%. Air standard efficiency 52%, Relative efficiency 70%, volumetric efficiency 78%, Stroke/bore ratio is 1.25, Suction condition is 1 bar 25°C. Speed 2400rpm, Power at brakes of 72kW. Solve
 - Compression ratio
 - Brake specific fuel consumption.
- Explain ignition lag in SI engine.
- Explain Willian's line and Morse test.
