

**MALLA REDDY COLLEGE OF ENGINEERING
AND TECHNOLOGY**

DEPARTMENT OF AERONAUTICAL ENGINEERING

II B.TECH I SEMESTER

***R15 SUPPLEMENTARY
PREVIOUS QUESTION PAPERS***

LIST OF SUBJECTS

<i>CODE</i>	<i>NAME OF THE SUBJECT</i>
R15A2102	Aircraft Engineering Drawing
R15A2101	Aircraft Production Technology
R15A0362	Mechanics of Fluids
R15A0363	Mechanics of Solids
R15A0364	Thermodynamics
R15A0067	Technology Management

R15

Code No: R15A2102

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, February 2021

Aircraft Engineering Drawing

(AE)

Roll No										
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Time: 2 hours 30 min

Max. Marks: 75

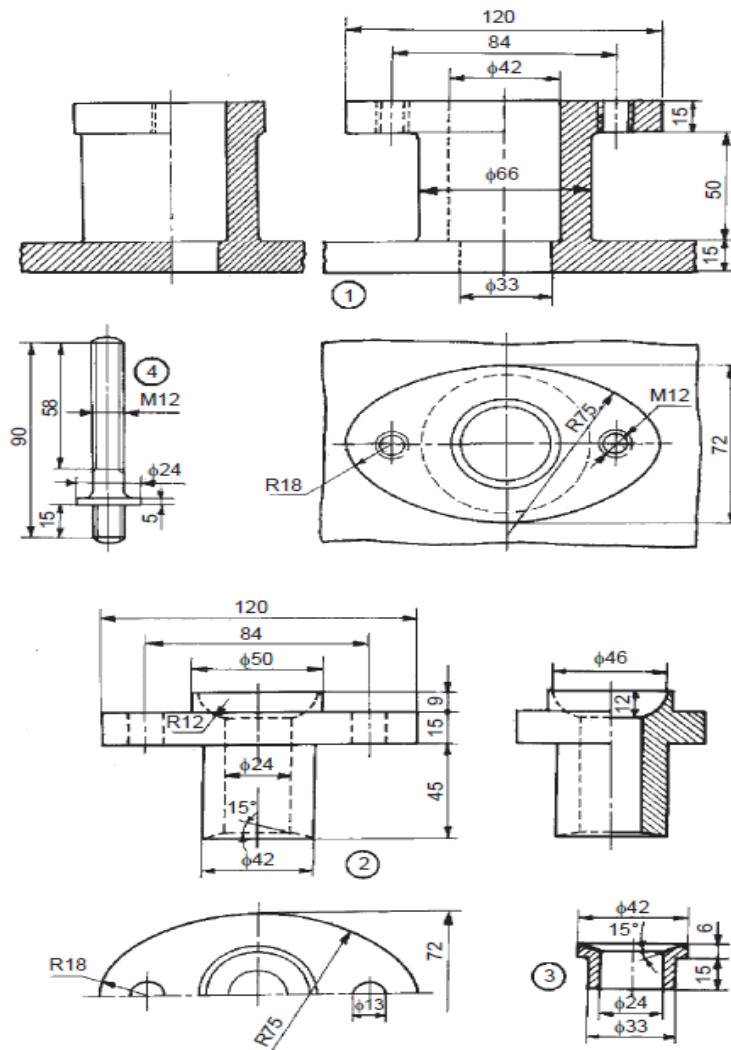
Answer Any **Five** Questions

All Questions carries equal marks.

- 1** Draw the development of the lateral surface of the lower portion of the cylinder of diameter 50mm and axis 70mm. The solid is cut by a section plane inclined at 40 degree to HP and perpendicular to VP and passing through the midpoint of the axis. **[15M]**
- 2** Draw the development of a pentagonal pyramid of base side 30mm and height 50mm. A string is wound from a corner of the base round the pyramid and back to the same point through the shortest distance. Show the position of the string in the elevation and plan. **[15M]**
- 3** **(a)** Sketch the conventional representation of the following: **[8 + 7 M]**
 - (i) Helical tension spring
 - (ii) Leaf spring with eyes and centre band**(b)** Draw the following types of threads with all the proportions where pitch of the thread is P:
 - (i) Buttress thread
 - (ii) Whitworth thread

- 4** **(a)** Show by sketches: **[6+9 M]**
- (i) Unidirectional system of dimensioning
 - (ii) Polar co-ordinate dimensioning
- (b)** Sketch the conventional representation of the following:
- (i) Square on shaft
 - (ii) Internal screw threads
 - (iii) Splined shaft
 - (iv) Interrupted views
- 5** Draw designation of shaft and hole sizes and limits. Define the terms: hole, nominal size, basic size, upper and lower limits of size, maximum material limit and least material limit. **[15M]**
- 6** A journal bearing consists of a bronze bush of diameter 100 mm fitted into a housing and a steel shaft of 50 mm diameter, running in the bush, with oil as lubricant. Determine the working dimensions of (a) bore of the housing, (b) bush and (c) shaft. Calculate the maximum and minimum interference or clearance. **[15M]**
- 7** Draw the sectional view from the front and view from the top of the double riveted double strap zig-zag butt joint with dia of the rivet as 16 mm. **[15M]**

- 8 Assemble all parts of the stuffing box for a vertical steam engine, shown in Figure and draw, (i) half sectional view from the front, with left half in section, (ii) half sectional view from the right and (iii) view from above. [15M]



Parts list

Part No.	Name	Matl	Qty
1	Body	CI	1
2	Gland	Brass	1
3	Bush	Brass	1
4	Stud	MS	2
5	Nut, M12	MS	2

R15

Code No: R15A2101

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, February 2021

Aircraft Production Technology

(AE)

Max. Marks: 75

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Code No: R15A0363

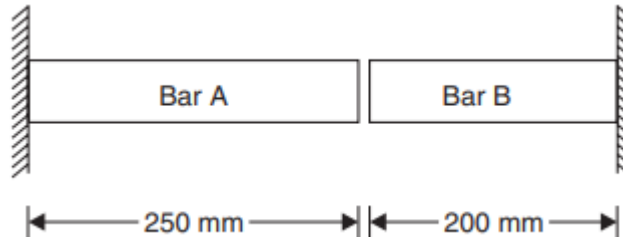
Roll No								
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Time: 2 hours 30 min

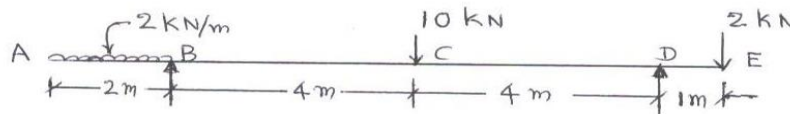
Max. Marks: 75

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 At room temperature the gap between bar A and bar B shown in the below is 0.2mm. [15M]
What are the stresses developed in the bars, if temperature rise is 30°C ? Given: $A_a = 800\text{mm}^2$ $A_b = 600\text{mm}^2$ $E_a = 2 \times 155 \text{ N/mm}^2$ $E_b = 1 \times 155 \text{ N/mm}^2$
 $\alpha_a = 12 \times 10^{-6}/^{\circ}\text{C}$ $\alpha_b = 23 \times 10^{-6}/^{\circ}\text{C}$ $L_a = 250 \text{ mm}$ $L_b = 200 \text{ mm}$.



- 2 Derive the relation between young's modulus, rigidity modulus and bulk modulus. [15M]
3 Sketch the S.F. &B.M. diagrams for an Overhanging beam ABCDE shown. Mark all the salient points with respective values. [15M]



- 4 A simply supported beam of 9m length carries a point load of 15kN at the right end and a uniformly distributed load of 30kN/m for a distance of 3m starting from left end. The supports of the beam are 6m apart, the left end support being at the left end. Draw the shear force and bending moment diagrams indicating main values. [15M]
5 A wooden beam is 8cm wide and 12cm deep with a semi-circular groove of 2cm radius planned out in the center of each side .calculate the maximum stress in the section when simply supported on the span of 3m, loaded with a concentrated load of 450N at a distance of 1m from the one end and a uniformly distributed load of 500N/m run over the whole span. [15M]
6 A simply supported beam of 2m span carries a uniformly distributed load of 140kN/m over the whole span. The cross section of the beam is a T-section with a flange width of 120mm, web and flange thickness of 20mm and overall depth of 160mm. determine the maximum shear stress in beam and draw the shear stress distribution for the section. [15M]
7 Explain briefly about Strain Energy and Shear Strain Energy Theory (Von Mises Theory). [15M]

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Time: 2 hours 30 min

Max. Marks: 75

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 A gas in a cylinder and piston arrangement comprise the system. Gas expands frictionlessly from 1.5 m^3 to 2 m^3 while receiving 2 Nm of work from a paddle wheel. Pressure of gas remains constant at 6 N/m^2 . Determine the net work done by the system. [15M]
- 2 Explain the concept of macroscopic and microscopic view points applied to the study of thermodynamics. [15M]
- 3 A cyclic heat engine operates between a source temperature of 800°C and a sink temperature of 30°C . What is the least rate of heat rejection per kW net output of the engine? [15M]
- 4 What is the importance of second law of thermodynamics? Give an example and explain the statement of second law of thermodynamics. [15M]
- 5 A certain gas has $c_p=1.968$ and $c_v=1.507 \text{ kJ/kgK}$. Find its molecular weight and gas constant. A constant volume chamber of 0.3 m^3 capacity contains 2 kg of this gas at 5°C . Heat is transferred to the gas until the temperature is 100°C . Find the work done, the heat transferred and the changes in internal energy, enthalpy and entropy. [15M]
- 6 What is an isothermal process? Represent p-v and T-s diagrams. Write the equation for work done change in I.E. and heat transferred. [15M]
- 7 Show that entropy is a property of the system. [15M]
- 8 With a neat sketch explain the working principle Vapour compression cycle [15M]

R15

Code No: R15A0067

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, February 2021

Technology Management

(ME & AE)

Roll No									
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Time: 2 hours 30 min

Max. Marks: 75

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 Define Technology Management and examine the relationship between the role of technology and competitive advantage of a firm. Give examples. **[15M]**
- 2 Discuss the role of Research and development in new product development at the corporate level. **[15M]**
- 3 Explain the concept of financial forecast. How an organization can reduce the risk in R&D? **[15M]**
- 4 Discuss the stages in project selection process. **[15M]**
- 5 Examine the role of research and development in promoting technology development. **[15M]**
- 6 Generalize the stages in new product development with suitable examples. **[15M]**
- 7 Discuss the role of technology forecasting in the emerging scenario. **[15M]**
- 8 Describe the stages of technology transformation. **[15M]**
