Set-04

(2013-14)

Symbol of Secularism & National Integration

ANJUMAN-I-ISLAM'S
KALSEKAR TECHNICAL CAMPUS, NEW PANVEL
School of Engineering & Technology

Subject: THERMODYNAMICS
Marks: 20
Class: S. E. SEM -III

Test -II

Date: 21 Oct. 2013
Duration: 1 Hr 00 Minutes
Branch: MECHANICAL

Instructions: i) Both questions are compulsory

Q. 1 Attempt any four [4X4 = 16 Marks]

1. *Explain the following; i) Availability ii) irreversibility iii) Dead state.*
2. *Define i) Wet team ii) Degree of super heat iii) Dryness fraction of steam*
3. Discuss the differences between 'Carnot cycle' and 'Rankine cycle'
4. *What are the assumptions of a air standard cycles.*
5. *Discuss and explain 'Higher and Lower heating value of fuel'.*
6. *Define i) Enthalpy of combustion ii) stoichiometric Air-Fuel ratio iii) Importance of adiabatic flame temperature*

Q. 2 Attempt any One [1X4= 04 Marks]

1. A boiler uses coal which has the mass composition as : C=84%, H2=3% and remainder as ash. The 'ORSAT' apparatus gave the volumetric analysis as follows; CO2=11.5%, O2=8.45 and N2=80.1%. Calculate the air-fuel ratio and the mass of excess air supplied.

2. What are different methods of increasing the efficiency of 'power plant working on Rankine cycle'?

3. What is cut-off ratio? How does it affect the thermal efficiency of a Diesel cycle?

----------X-X-X-X-X-X-X-X----------

(2013-14)

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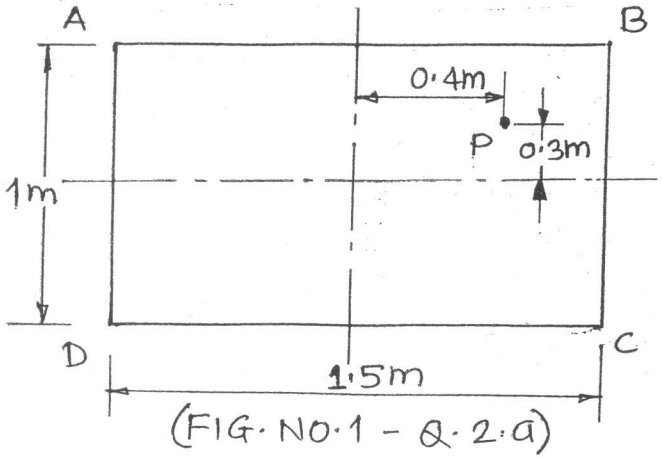
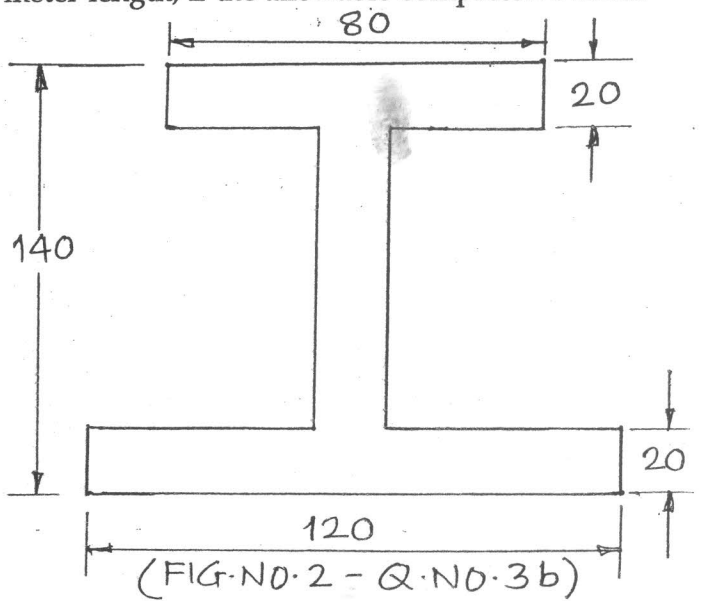
Subject: Strength of Materials | **Date: 22.10.2013**
Marks: 20 | **Duration: 01Hr**
Class: SE-ME (III) (UNIT TEST-2) | **Branch: Mechanical Engg.**

Instructions: 1. All questions are compulsory.
2. Figures to the right indicate maximum Marks.
3. Use of non-programmable calculator is permitted.

1. Attempt Any Four. (12)
   a. What are the assumptions made in theory of simple bending? Write the Flexural formula.
   b. Find the maximum eccentricity of the load 10000 N so as to have no tension in a hollow rectangular section of 2000mm x 1000 mm as outside dimension & thickness as 100 mm.
   c. What are the assumptions made while deriving shear stress equation?
   d. Derive torsion equation & what are the assumptions made in pure torsion.
   e. Define: Resilience, Proof Resilience & Modulus of Resilience.
   f. A vertical steel bar of 25 mm diameter & 1.5 m long is provided with a collar at lower end. Find the maximum weight W that can be dropped through 95 mm over the collar, if maximum permissible tensile stress is 180 MPa. Take, E= 210 GPa
2. Attempt Any One. (04)
   a. A rectangular section is subjected to a load of 1000 KN as shown in fig.1. Find the stress intensities at the four corners.
   b. A hollow circular shaft of 100 mm as outer diameter & 80 mm inner diameter. Find the power transmitted if permissible shear stress is not to exceed 100 MPa & maximum angle of twist is 20 in 3 m length. Consider shaft to be rotating at 60 RPM & over load as 20%. Take, G= 80 GPa.
3. Attempt Any One. (04)
   a. A simply supported beam with unsymmetrical I-section, Top flange of 60mmx20mm, bottom flange of 80 mm x 20 mm, web thickness as 20 mm & overall depth as 100 mm. The beam is 4 m long & carries a u.d.l. of 1000 N/m. Find shear stress at all critical points in a section 1.4m from left support. Draw shear force distribution diagram also.
   b. A simply supported beam of span 6m & the cross section of which is I-section, Top flange of 80mmx20mm, bottom flange of 120 mm x 20 mm, web thickness as 20 mm & overall depth as 140 mm. Find the safe load the beam can carry per meter length, if the allowable compressive stress in the beam is 40 MPa. (Refer Fig.2)



(FIG. NO. 1 - Q. 2.a)



(FIG. NO. 2 - Q. NO. 3b)

(2013-14)

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Subject : Production Processes - I — **Marks: 20** Oct. 13
Unit Test - II — **Duration: 1 Hr**
Class : S.E. Sem-III — **Branch :Mechanical**

Instructions: Answer with a neat labelled sketch as far as possible.

Q.1. Attempt any six of the following questions (2 marks x 6 = 12 marks).

a. What are the advantages of hot working processes?
b. Describe with a neat sketch the difference between open-die forging and closed-die forging.
c. Draw a neat labelled sketch of Stretch Forming operation.
d. Name and sketch any four welding joints.
e. How is Compression Moulding done?
f. Describe Wire Drawing Operation with a neat sketch.
g. Describe any one process of making seamless tubes.

Q.2. Attempt any two of the following questions (4 marks x 2 = 8 marks).

a. Describe Magnetic Particles Inspection.
b. How is Injection Moulding done for Thermoplastics?
c. Name any four additives used in plastic processing and state their functions.

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Subject: Applied Maths-III
Date: 04·13
Class: S.E
Semester: III

Marks: 20
Duration: 1 Hr
Branch: CE/ME
Test: First

Test-II

(2013-14)

I. Attempt any two questions: (2x4=8)

1. Find the bilinear transformation which maps the points z=0,i,-1 onto w= i,1,0.
2. Evaluate $\int_c \frac{dz}{z^3(z+4)}$, where c is the circle $|z| = 2$
3. Find Fourier series expansion of $f(x) = x^2$ in $[0,2\pi]$
4. Evaluate $\oint \frac{3z^2+z}{z^2-1}\, dz$ over the curve C: $|z| = 2$

II. Attempt any two questions: (2x6=12)

1. Evaluate $\int_0^{2\pi} \frac{d\theta}{5+3\sin\theta}$
2. Find the image of the circle ~~$|z|=$~~ $|z-1|=1$ under the transformation $w = z^2$
3. Find Laurent's series which represents the function $f(z) = \frac{2}{(z-1)(z-2)}$ when (i) $|z| < 1$ (ii) $1 < |z| < 2$