

Total No. of Pages 1

Roll No. ....

## EIGHTH SEMESTER

**B.E. (ME)**

MID SEMESTER EXAMINATION **MARCH 2005**

### ME-411 INDUSTRIAL ENGINEERING

Time: 1 Hour 30 Minutes

Max. Marks : 20

**Note :** Answer **ALL** questions.  
Assume suitable missing data, if any.

- 1[a] What are the major factors in deciding the facility location problem? (2)
- [b] Explain the principles of facility layout in relation to worker effectiveness. (2)
- [c] What advantages of product layout and process layout do you find in combination layout. (2)
- [d] What is the procedure for SLP. (2)
- [e] Define computerized layouts. (2)
- 2[a] What are the application areas of Industrial Engineering. (2)
- [b] Define Quality and its dimensions. (2)
- [c] "Quality is inversely proportional to variability". Explain. (2)
- [d] Define control chart and explain quality-engineering techniques i.e Acceptance sampling, SPC and Design of experiments. (4)

Total No. of Pages 2

Roll No. ....

## EIGHTH SEMESTER

**B.E. (ME)**

MID SEMESTER EXAMINATION **MARCH 2005**

### ME-413 POWER PLANT PRACTICE

Time: 1 Hour 30 Minutes

Max. Marks : 20

**Note :** Answer **ALL** questions.  
Assume suitable missing data, if any.

- 1 Write the contribution of thermal, hydro and nuclear power plants in total installed capacity. How do the load curves help in planning of power plant's capacity? (2)
- 2 Write the criteria for selecting a site for coal based power plant. (1)
- 3 What do you understand by M.G.R system of coal transportation? Explain. (1)
- 4 Explain spontaneous combustion. Write the steps taken in power plant to minimize the loss caused by it.. (2)
- 5 Explain the physical significance of need of excess air for combustion. How does it affect the dry flue gases loss, unburnt gases loss, unburnt carbon loss? (3)
- 6 Explain proximate analysis of coal. (2)
- 7 Plant load factor (P.L.F) is not a real indicator of plant performance, explain. (1)
- 8 Calculate cost of generation of 1 Kwh electricity from a 200 MW power station. The yearly capital cost is Rs.30,000 per kW of installed capacity, interest and depreciation 10% on capital, fuel consumption 1.2 kg/kwh, fuel cost Rs.400/Ton,

salaries/wages and repair/ maintenance cost Rs.150 X 10<sup>6</sup> per year. Take PLF as 50%. (5)

- 9 Briefly, explain the working of fluidized bed combustor. Write its major advantages over pulverized coal fired boiler. (3)

Total No. of Pages 1

Roll No. ....

## EIGHTH SEMESTER

**B.E. (ME)**

MID SEMESTER EXAMINATION **MARCH 2005**

### ME-416 COMBUSTION ENGINE EMISSIONS

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer **ALL** questions.

- 1 "The formation CO is one of the essential intermediate reaction steps in the hydrocarbon combustion mechanism leading to final product  $\text{CO}_2$ ". Write down governing intermediate equations which result in formation of CO. (2)
  - 2 "Air-fuel ratio requirements for a gasoline engine is different at different operating conditions". Explain how exhaust emissions of carbon monoxide will vary with the variation of these operating conditions. (3)
  - 3 Write down Zeldovitch equations which lead to formation of nitric oxide (NO) in the flame front and in the post flame gases near the flame zone. (2)
  - 4 "Spark timing significantly affects NO emission levels in SI engines". Explain the variation of NO with the variations of spark timing at different air-fuel ratios. (2)
  - 5 "The crevices in the combustion chamber walls are small volumes with narrow entrances".-Explain how these crevices increase unburned HC emissions in spark ignition engines. (4)
  - 6 "HC emissions are not only higher at very rich mixture but also they are high at very lean mixtures".-Justify the statement with reasons. (2)
- What is vapour lock? Explain how vapour lock, hot start and fuel economy are related to ASTM distillation curve of gasoline. (5)

Total No. of Pages 1

Roll No. ....

## EIGHTH SEMESTER

**B.E. (ME)**

MID SEMESTER EXAMINATION **MARCH 2005**

### ME418 INDUSTRIAL QUALITY CONTROL

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer **ALL** questions.  
Assume suitable missing data, if any.

- 1 Differentiate between
  - [a] Cost of quality and value of quality
  - [b] Quality of design and Quality of conformance (5)
- 2 State the scope of Quality Control function in an engineering industry. Give details of various aspects and necessary steps to achieve quality control. State the role of inspection in quality control. (5)
- 3 Discuss different tools and techniques of Total Quality Management (TQM). (4)
- 4[a] How does Capability ratio differ from Capability index. (2)  
[b] Five samples were taken randomly from the manufactured lot of an item and three measurements were taken on each sample. The readings are shown in the following table.

Sample No.	Three measurements per sample		
	I	II	III
1	0.488	0.489	0.505
2	0.494	0.495	0.499
3	0.498	0.515	0.487
4	0.492	0.509	0.514
5	0.490	0.508	0.499

Calculate the control limits on  $\bar{X}$  and R charts and draw the charts. Take constants as  $A_2 = 1.02$ ,  $D_3 = 00$ ,  $D_4 = 2.57$  (4)

Total No. of Pages 1

Roll No. ....

## EIGHTH SEMESTER

**B.E. (ME/PE)**

MID SEMESTER EXAMINATION **MARCH 2005**

### ME-419/PE-421 MATERIALS MANAGEMENT

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer **ALL** questions.  
Assume suitable missing data, if any.

1 Explain different types of inventory policy. (6)

2 An organization is to decide about the number of expensive spares of a particular type to be ordered along with the procurement of the main equipment. Each spare cost Rs.12,000/- and the opportunity cost of non-availability is estimated to be 18 times this cost. A surplus spare can be salvaged at 60% of the purchase price. During planning period, the demand for the spare is estimated according to the following probability distribution:

Demand	0	1	2	3	4	5	6
Probability	0.60	0.20	0.10	0.05	0.04	0.01	0.00

What should be the optimal number of spares to be ordered?

3 Explain Aggregate inventory analysis with exchange curve concept. (4)  
(5)

4 Write short notes on any **TWO** of the following :

- [a] Types of inventory
- [b] Estimation of cost of shortage
- [c] Colour coding of ABC analysis.

(5)

Total No. of Pages 1

Roll No. ....

## **EIGHT SEMESTER**

**B.E. (ME)**

**MID SEMESTER EXAMINATION MARCH 2005**

### **ME-421 EXPERIMENTAL STRESS ANALYSIS**

*Time: 1 Hour 30 Minutes*

*Max. Marks : 20*

**Note :** Attempt **THREE** questions.  
Question No. **ONE** is compulsory.  
Assume suitable missing data, if any.

- 1[a] With the help of neat sketch distinguish between two plane or linearly polarized light waves having same frequency but mutually perpendicular planes of vibration and elliptically polarized light. 5
- [b] Describe wave plates and quarter wave plates. 3
2. Draw and describe the schematic diagram for an arrangement of the optical elements in a Polariscope of the optical elements in a Polariscope and also make the table of the optical elements in a circular Polariscope. 6
3. Describe the effects of stressed model in a circular Polariscope (Dark Field and Light Field arrangement). 6
- 4[a] What are the properties of an ideal photoelastic material.
- [b] Enumerate the photoelastic materials and their properties. 6

Total No. of Pages 1

Roll No. ....

## EIGHTH SEMESTER

**B.E. (ME)**

MID SEMESTER EXAMINATION **MARCH 2005**

### ME-425 ANALYSIS AND SYNTHESIS OF LINKAGES

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer **ALL** questions.

Assume suitable missing data, if any.

- 1[a] What are class I and class II mechanisms? (2)
- [b] What is Grublers equation? (2)
- [c] What is transmission angle? (2)
- [d] What are similarly varying triangles? (2)
- [e] What is time ratio? (2)
- 2 Design a four bar mechanism for an output angle of  $60^\circ$  and the time ratio 1.25. (5)
- 3 Derive write and the flow chart of computer program for displacement, velocity and acceleration of a slider crank mechanism (5)