

G 7007

(Pages : 2)

Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, APRIL 2011**

**Eighth Semester**

Branch : Mechanical/Automobile Engineering

**PRODUCTION ENGINEERING (MU)**

(Regular/Supplementary)

Time : Three Hours

Maximum : 100 Marks

*Answer all questions.*

**Part A**

*Each question carries 4 marks.*

1. What is the effect of rake angle on cutting force ?
2. What is shear angle ? Discuss its importance.
3. What are the factors influencing machinability of metals ?
4. Define tool life of a cutting tool.
5. Explain any one method of preparation of metal powder.
6. What is meant by pre-sintering ?
7. Explain slip casting process.
8. Write a note on glass ceramics.
9. What is rapid prototyping ?
10. List out the advantages of EDM.

(10 × 4 = 40 marks)

**Part B**

*Each question carries 12 marks.*

11. Discuss the mechanism of chip formation. Give the classification of chips with sketches.

*Or*

12. What is meant by tool geometry ? Explain the tool geometry of a twist drill.

13. Explain the mechanism of tool wear. How can it be measured ?

*Or*

14. What are the properties of required for a tool material ? Give the details of some common tool materials.

15. Define the following terms in relation to metal powders :

Surface area, Compressibility, Apparent density and particle size distribution.

*Or*

**Turn over**

16. Write notes on :

Hot pressing, Impact compacting and powder rolling.

17. What is meant by smart materials ? Discuss about their properties and application areas.

Or

18. Classify ceramic materials. Discuss the steps of processing of ceramics.

19. Draw the schematic arrangement of ECM. Explain its working and limitations.

Or

20. Explain the working of Electron Beam machining with the help of a neat diagram. Discuss its application areas.

(5 × 12 = 60 marks)

G 7014

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, APRIL 2011**

**Eighth Semester**

Branch : Mechanical Engineering

**AUTOMOBILE ENGINEERING (M).**

(Regular/Supplementary)

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions.*

*Each question carries 4 marks.*

1. What are the functions of the Cylinder head gasket ?
2. What are the functions of a Carburettor ?
3. What are the various forces that act on a moving vehicle ?
4. Explain briefly the four wheel drive transmission.
5. Indicate the different types of steering linkages.
6. What is caster angle ? How does caster help to produce directional stability ?
7. Differentiate between tubed and tubeless tyres.
8. What is meant by self locking tendency of brakes ? What factors help this to occur ?
9. Indicate the different starter drives used in an auto mobile.
10. What is the function of the ignition coil ? Explain briefly its construction.

(10 × 4 = 40 marks)

**Part B**

*Each question carries 12 marks.*

11. (a) Indicate the features of SPFI, MPFI and direct injection of fuel.  
(b) What are the design criteria for a SI engine combustion chamber.

*Or*

12. With simple sketches, explain the different types of lubricating systems used in automotive vehicles.
13. With neat sketches, explain different types of gearboxes used in automotive vehicles.

*Or*

Turn over

14. (a) What is a torque converter ? Why it is used in some vehicles ?  
 (b) Sketch and explain any *one* type Centrifugal clutch.

Or

15. With sketches explain the details of live real axles.

Or

16. Explain briefly air suspension system.

17. (a) Draw the layout of hydraulic brake systems showing all the components and explain its working in detail.

- (b) Sketches the sectional view of the tyre and indicate its various parts.

Or

18. (a) What is anti lock braking system ? How does it works ?

- (b) Sketch the layout of a car air conditioning system.

19. Write short notes on :

- (i) Wheel balancing.
- (ii) bendix drive.
- (iii) Engine turning.

Or

20. Explain briefly the electronic ignition system. What are its merits and demerits compared to the conventional battery ignition system.

[5 × 12 = 60 marks]

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, APRIL 2011**

**Eighth Semester**

**Branch : Mechanical Engineering**

**MACHINE DESIGN AND DRAWING II (M)**

**(Regular/Supplementary)**

**Time : Three Hours**

**Maximum : 100 Marks**

*Answer any two questions from Part A and Part B.*

*Design data book is permitted.*

*Missing data may be assumed.*

**Part A**

1. (a) Explain the nomenclature of spur gears. (5 marks)  
(b) A pinion with 25 teeth and rotating at 1200 r.p.m. drives a gear which rotates at 200 r.p.m. The module is 4 mm. Calculate the centre distance between the gears. (20 marks)
2. (a) Explain different type of helical gears. (5 marks)  
(b) A pair of helical gears consists of a 25 teeth pinion meshing with a 50 teeth gear. The normal module is 4 mm. Find the required value of helix angle if the centre distance is exactly 165 mm. (20 marks)
3. (a) Compare bevel gear and helical gear. (5 marks)  
(b) A pair of straight level gears consists of a 30 teeth pinion of meshing with a 45 teeth gear. The module and the face widths are 6 mm and 50 mm respectively. The pinion and the gear are made of steel. ( $S_{ut} ; 600N/mm^2$ ). Calculate the beam strength of the tooth. (20 marks)
4. (a) Why is heat dissipation a very important aspect of worm and worm gear ? (5 marks)  
(b) A pinion (worm) rotating at 700 r.p.m. transmits 45 kW. The speed reduction ratio is 25. Design a worm and worm gear drive. (20 marks)

[2 × 25 = 50 marks]

**Turn over**

## Part B

5. (a) Explain the different types of thrust bearings. (5 marks)
- (b) Determine the minimum speed of operation of a dynamic journal bearing operating under the following conditions : —

Load on the bearing = 75 kN ; Journal dia = 125 mm

Bearing length = 150 mm. Clearance ratio = 0.0012

Absolute viscosity of the oil = 8 centipoise.

(20 marks)

6. Following data is given for a 360° hydro dynamic bearing. Journal dia = 100 mm ; bearing length = 100 mm ; radial load 50 kN ; journal speed – 1440 r.p.m ; radial clearance = 0.12 mm. Viscosity of oil – 16 CP. Calculate (i) Minimum film thickness (ii) coefficient of friction and (iii) power lost in friction.

(25 marks)

7. The following data is given for a full hydrodynamic bearing : —

Radial load = 25 kN ; Journal speed = 900 r.p.m ; Unit bearing pressure = 2.5 MPa.

$L/D$  ratio = 1 : 1, Viscosity of the lubricant = 20 cp ; class of fit  $^2H_7e_7$ . Calculate (i) Dimensions of the bearing (ii) the minimum film thickness and (iii) requirement of oil flow.

(25 marks)

8. Select the impeller for a centrifugal pump for the following : —

Requirement : —

Discharge = 1000 l.p.m.

Speed = 2000 l.p.m.

Suction head = 6 m of water.

Delivery head = 30 m of water.

Coefficient of friction = 0.01.

(25 marks)

[2 × 25 = 50 marks]

**G 7050**

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, APRIL 2011**

**Eighth Semester**

Branch—Mechanical Engineering

**AEROSPACE ENGINEERING—Elective (II) (M)**

(Regular/Supplementary)

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all the questions.  
Each question carries 4 marks.*

1. Write down the Bernoullis equation for a compressible fluid. What are the assumptions in the derivation of the equation.
2. Explain why an airplane moving at supersonic speed, when passes over a stationary ground observer cannot be heard until it has passed over the observer.
3. What are the various drag reduction method used in aeroplanes ?
4. Explain the terms : Chord, Span, Aspect ratio and camber as applied to an aerofoil.
5. Discuss the basic characteristics of the Ramjet engine.
6. Discuss the effect of forward speed and attitude on the performance of Turbojet engine.
7. What do you mean by Aerobatics ?
8. Differentiate between circling Flight and Banked Flight.
9. Write short notes on supersonic wind tunnel.
10. What are the advantages and disadvantages of liquid propellant rocket engines ?

(10 × 4 = 40 marks)

**Part B**

*Answer all the questions.  
Each question carries 12 marks.*

11. Considering a fixed control volume with one inlet and one out, derive the Reynolds transport equation. Deduce the continuity equation for incompressible flow.

*Or*

12. (a) What is international standard atmosphere ?  
(b) An observer at sea level does not hear an aircraft that is flying at an attitude of 7000 m until it is a distance of 13 km from the observer. Estimate the Mach number at which the aircraft is flying. In arriving at the answer, assume that the average temperature of the air between sea level and 7000 m is  $-10^{\circ}\text{C}$ .

**Turn over**

13. (a) Explain Kutta-Joukowski theorem.

(b) What is meant by Horse shoe vortex ?

Or

14. Discuss the variation of pressure coefficient with Mach Number over an aerofoil.

15. Derive expression for thrust and efficiency of a propeller by blade element theory.

Or

16. (a) With a neat sketch explain the working of a Turbo fan engine.

(b) Discuss the use of after Burner in Air breathing engines.

17. Derive an expression for power required for level an accelerated flight.

Or

18. Derive expressions for Range and Endurance of propeller-Driven Aircraft.

19. (a) Differentiate between true air speed and indicated air speed.

(b) Explain how forces and moments on a Prototype aeroplane can be estimated by testing a model in a wind tunnel.

Or

20. With neat sketches explain the working of a solid propellant rocket and mention its advantages and disadvantages.

(5 × 12 = 60 marks)



G 7084

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**B.TECH. DEGREE EXAMINATION, APRIL 2011**

**Eighth Semester**

**Branch—Mechanical Engineering**

**MANAGEMENT INFORMATION SYSTEM (Elective-III) (M)**

**(Regular/Supplementary)**

Time : Three Hours

Maximum : 100 Marks

*Answer all questions.*

**Part A**

*Each question carries 4 marks.*

1. Give an example of data and demonstrate how these data can be made into information.
2. What are the different levels of management in an information system ?
3. What are the components of Data Processing System ?
4. What is meant by time sharing in DBMS ?
5. Explain the term 'back bone network'.
6. What is a LAN ? Compare it with WAN.
7. Explain the objectives of the business systems planning methodology.
8. What is meant by application development cycle ?
9. What are the security issues connected with MIS ?
10. What is meant by Reliability goals of MIS ?

(10 × 4 = 40 marks)

**Part B**

*Each question carries 12 marks.*

11. (a) Explain the subsystems of MIS, based on the Management activities.

*Or*

- (b) Discuss about the various classifications of MIS.

12. (a) What is meant by a business model ? Explain with the help of an example.

*Or*

- (b) What are the key features of a DBMS ? What is meant by RDBMS ?

**Turn over**

13. (a) How might on MIS change the typical manager's day to day communications ? Discuss.

Or

(b) What is the essence of distributed data processing ? Explain its application areas.

14. (a) Explain the steps involved in the design of an Information database system.

Or

(b) Describe the organisational structure to manage the MIS in an industry.

15. (a) Describe the working process of security testing of MIS.

Or

(b) Explain the architectural details of an MIS for a financial management systems.

(5 × 12 = 60 marks)

G 7085

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, APRIL 2011**

**Eighth Semester**

Branch : Mechanical Engineering

CRYOGENICS—(Elective III) (M)

(Regular/Supplementary)

Time : Three Hours

Maximum : 100 Marks

*Approved tables and charts are permitted.*

**Part A**

*Answer all questions.*

*Each question carries 4 marks.*

1. What do you mean by Kapitza resistance ?
2. Write notes on adiabatic demagnetization.
3. Explain the uses of liquid Nitrogen.
4. Why is it that good electrical conductors like gold, silver and copper do not exhibit superconductivity ?
5. What is the basic difference between a liquefier and a refrigerator ?
6. What do you mean by thermodynamic efficiency of a cycle ?
7. What is inversion temperature ?
8. Why pre-cooling is required in some gas liquefaction systems ?
9. What is superfluidity ?
10. What is Meissner effect ?

(10 × 4 = 40 marks)

**Part B**

*Answer all questions.*

*Each question carries 12 marks.*

11. Explain the historical development of Cryogenic Engineering since 1877.

*Or*

12. Explain the contribution of Linde in the field of Cryogenic Engineering.
13. Explain the effect of low temperature on any *two* electrical properties of Engineering materials.

*Or*

**Turn over**

14. What is the transition temperature and critical temperature with reference to superconductors. What is the highest transition temperature that could be expected from theory.
15. Explain Simon Helium liquefaction system with a Schematic diagram.

*Or*

16. Write notes on ortho-para conversion in hydrogen liquefaction.
17. Explain a two stage pulse tube, refrigerator with the help of a neat schematic diagram.

*Or*

18. Explain the working of Philips refrigeration system and derive an expression for C.O.P.
19. Explain a Dewar Vessel with a neat sketch.

*Or*

20. Write short notes on Cryogenics in Biology and Medicine.

(5 × 12 = 60 marks)

**G 7086**

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, APRIL 2011**

**Eighth Semester**

Branch—Mechanical Engineering

**TOTAL QUALITY MANAGEMENT (Elective III) (M)**

(Regular/Supplementary)

Time : Three Hours

Maximum : 100 Marks

*Answer all questions.*

**Part A**

*Each question carries 4 marks.*

1. Lit out any *four* characteristics of successful quality leaders.
2. Describe the concept of Quality council.
3. Define Re-engineering.
4. What are the major components of Quality Cost ?
5. How does Quality Control differ from Quality Assurance ?
6. Describe 'House of Quality'.
7. Explain the functioning of KANBAN system.
8. Quality circle is a small group activity. Explain.
9. "TQM is an enhancement to the traditional way of doing business". Discuss.
10. What are the barriers to the implement of TQM in a service organization ?

(10 × 4 = 40 marks)

**Part B**

*Each question carries 12 marks.*

11. (a) Explain the effective employee reward practises an organization.  
*Or*  
(b) What are the common team problems and their solutions in an organisation ?
12. (a) Describe the continuous process improvement cycle. Establish how is it related to POSA cycle.  
*Or*  
(b) Explain on Juran's ten steps to Quality improvement.

**Turn ove**

13. (a) What is FMEA ? Explain the various elements of FMEA document.

Or

(b) Describe the use of paretodiagram with the help of an example. How does it differ from Histogram.

14. (a) What is the principle behind Just in time techniques ? What are it's merits and demerits ?

Or

(b) Discuss the total quality control tools with their application areas.

15. (a) Narrate the details of implementation of TQM in an educational Institution.

Or

(b) Discuss the terms customer satisfaction, supplier partnership and zero defect" with reference to the implementation of TQM in a manufacturing firm.

(5 × 12 = 60 marks)

**B.TECH. DEGREE EXAMINATION, APRIL 2011**

**Eighth Semester**

Branch : Mechanical Engineering

**PRODUCTION PLANNING AND CONTROL (M)**

(Regular/Supplementary)

Time : Three Hours

Maximum : 100 Marks

**Part A**

Answer all questions.

Each question carries 4 marks.

1. What is the function of a forecasting technique ?
2. What do you understand by the term PPC ?
3. Define Bill of Materials.
4. What is a route sheet ?
5. Describe two machine-*n* job sequencing problem.
6. Explain "Johnson's rule" with an example.
7. What is the role of IT in materials management ?
8. Explain "Two-bin system" of storage.
9. What is meant by dispatching ?
10. "CPM is an activity oriented network"—Discuss.

(10 × 4 = 40 marks)

**Part B**

Each question carries 12 marks.

11. (a) Discuss the moving average model of forecasting and mention its drawbacks.

Or

- (b) Demand for an item Y from March to August 2010 is as follows. Calculate the demand for September 2010 using simple moving average method.

Months	March	April	May	June	July	August
Demand	20	23	19	21	26	24

Turn over

12. (a) Why is capacity planning important? Outline the steps involved in a capacity planning exercise.

Or

(b) What is meant by process planning? Discuss the steps in process planning.

13. (a) Find out the optimal schedule for the following problem:

Job	1	2	3	4	5
Machine 1 (Time hrs)	11	13	15	12	20
Machine 2 (Time hrs)	10	8	6	7	9
Machine 3 (Time hrs)	12	20	15	19	7

Or

(b) With the help of the following problem, describe the algorithm for solving an 'njob-2 machines' sequencing situation.

Job	J <sub>1</sub>	J <sub>2</sub>	J <sub>3</sub>
Machine 1 (Processing Time hrs)	5	6	4
Machine 2 (Processing Time hrs)	7	3	6

14. (a) What is supply chain? Discuss the different stages in a supply chain.

Or

(b) What is meant by "Vendor rating"? Discuss the factors to be considered in source selection.

15. (a) How is scheduling of operations done in a flow shop? What are the well known algorithms used for flow shop scheduling?

Or

(b) Consider the following project:—

Activity	Predecessor	Duration (days)		
		a	b	c
A		4	6	8
B	A	5	7	15
C	A	4	8	12
D	B	15	20	25
E	B	10	18	26
F	C	8	9	16
G	E	4	8	12
H	D,F	1	2	3
I	G, H	6	7	8

Construct the arrow diagram, compute the expected project duration and determine the critical path.

(5 × 12 = 60 marks)



G 7052

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, APRIL 2011**

**Eighth Semester**

Branch : Mechanical Engineering

**PROJECT MANAGEMENT (Elective II) (M)**

(Regular/Supplementary)

Time : Three Hours

Maximum : 100 Marks

**Part A**

Answer all questions.

Each question carries 4 marks.

1. How is it determined if the feasibility of an idea should be investigated ?
2. What kind of analysis are done in the feasibility study for new products ?
3. Describe the characteristics of projects.
4. Distinguish resource loading from resource levelling.
5. Discuss the role of forecasting in project management.
6. What is the difference between a trend and a cycle and a seasonal pattern ?
7. Discuss the difference between internal risk and external risk. List sources of risk in each of those categories.
8. List and review the principles of risk management.
9. Discuss the term "postcompletion project review".
10. What are the purposes of project review meetings ?

(10 × 4 = 40 marks)

**Part B**

Answer all questions.

Each question carries 12 marks.

11. Describe the project proposal preparation process. Explain the contents of a proposal.

Or

12. What is a feasibility study ? Describe its contents and purpose.

Turn over

13. The management of a factors is going to erect a building with a connecting electrical generator and water tank. The activities, activity descriptions and estimated durations are given in the following table :

Activity	Description	Predecessor	Duration (Weeks)
a	Excavate	—	2
b	Erect building	a	6
c	Install generator	a	4
d	Install tank	a	2
e	Install maintenance equipment	b	4
f	Connect generator and tank	b, c, d	5
g	Paint	b	3
h	Check out facility	e, f	2

Construct a network, identify the critical path.

Or

14. Select an everyday "project" you are familiar with and develop a work breakdown schedule for it.
15. Describe the relationship between forecasting and project management. What are the difference between short and long-range forecasts? What kinds of forecasting methods are used for long-range strategic planning?

Or

16. A Pizza delivery service has randomly selected eight week days during the past month and recorded order for Pizza at 4 different time periods/day as follows :

Time Period	Days							
	1	2	3	4	5	6	7	8
10 am– 3 pm	62	49	53	35	43	48	56	43
3 pm–7 am	73	55	81	77	60	66	85	70
7 pm– 11 pm	42	38	45	50	29	37	35	44
11 pm–2 am	35	40	36	39	26	25	36	31

Develop a seasonally adjusted forecast model for daily pizza demand and forecast demand for each of the time periods for a single upcoming day.

17. Differentiate between decision tree and pay off table. Explain the concept of sequential decision trees, with a suitable example.

Or

18. Describe the applications, advantages and limitations of simulation. Classify the simulation models.
19. Describe about MS project and other popular project management softwares.

Or

20. (i) What is the purpose of project review meetings? Describe in detail about formal and informal reviews.
- (ii) What are the essential contents of progress reports sent to top management and office of projects? When and what kind of reports are sent to the customer?

(5 × 12 = 60 marks)