

Code No: K0221

R07

Set No. 1

6. a) Explain Electric Traction system and discuss its merits over other traction systems.
b) Enumerate the differences between Rheostatic Braking and Plugging. [8+8]
7. Derive the equation of the maximum speed at the end of acceleration and speed at the end of coasting for an approximate Quadrilateral speed –time curve. [16]
8. Write short notes on the following:
a) Specific Energy consumption
b) Tractive Effort
c) Polar curves [5+5+6]



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Set No. 2

6. a) Explain how plugging and rheostatic braking are employed with dc motors.
b) Explain Vacuum Brake, compressed air brake and magnetic track brake with proper diagrams that are used in traction. [8+8]
7. Derive the equation of the crest speed for an approximate trapezoidal speed –time curve. [16]
8. Write short notes on the following:
a) Mercury Vapour lamp
b) Flood Lighting
c) Coefficient of Adhesion [6+5+5]



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Set No. 3

7. a) Explain crest speed, average speed and schedule speed and discuss the factors effecting the schedule speed
b) Explain the different factors effecting the Specific Energy consumption. [8+8]
8. Write short notes on the following:
a) Adhesive weight
b) Sodium Vapour lamp
c) Load Equalization [5+6+5]



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R07

Set No. 4

IV B.Tech II Semester Supplementary Examinations, July - 2013

UTILIZATION OF ELECTRICAL ENERGY

(Electrical and Electronics Engineering)

Time : 3 hours

Max. Marks : 80

**Answer any Five Questions
All Questions carry equal marks**

1. a) Explain the terms 'continuous' and 'intermittent' ratings of an electric motor giving an example of each.
b) What are the reasons for using load equalization in electric drives? Explain with example a drive requiring load equalization. [8+8]
2. Explain the construction and operation of the coreless induction furnace and sources of high frequency currents. List the various applications of high frequency induction heating. [16]
3. a) Explain why a drooping characteristic of supply voltage is essential for maintaining a steady arc in case of electric arc welding and explain how this characteristic is obtained in case of (i) a dc source and (ii) ac source.
b) List the advantages of electric welding over gas welding. [10+6]
4. Define and explain the following terms with respect to the illumination Engineering:
a) Luminous Efficiency b) Absorption Factor
c) Luminance d) Space height Ratio [4x4=16]
5. a) State and explain laws of illumination.
b) Estimate the number and wattage of lamps which would be required to illuminate a workshop space 60 x 15 meters by means of lamps mounted 5 meters above the working plane. The average illumination required is about 100 lux, coefficient of utilisation = 0.4, luminous efficiency is 16 lumens per watt. Assume a space – height ratio of unity and a candle power depreciation of 20 %. [8+8]



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6. a) What are the various methods of Electric braking? Explain these methods in reference to a dc series motor.
b) What are the advantages of regenerative braking? Explain how regenerative braking can be obtained in dc locomotives. [8+8]
7. a) Explain different speed time curves with respect to urban service and sub urban service.
b) Explain the terms i) Dead Weight ii) Accelerating weight iii) Adhesive weight iv) coefficient of Adhesion. [8+8]
8. Write short notes on the following:
a) Group drive and individual drive
b) Fluorescent tubes
c) Street lighting [5+6+5]



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Set No. 1

IV B.Tech II Semester Supplementary Examinations, July - 2013

PRODUCTION PLANNING & CONTROL

(Mechanical Engineering)

Time : 3 hours

Max. Marks : 80

**Answer any Five Questions
All Questions carry equal marks**

1. Discuss the scope of PPC in an automobile plant.
2. a) How do you forecast demand in case of a new product?
b) What are the principles of forecasting?
3. Distinguish between P-system and Q-system with an example.
4. Discuss the principle of MRP with an illustration.
5. Explain the factors affecting routing procedure.
6. Discuss various scheduling policies with examples.
7. What is line balancing? What is its purpose? Explain any one quantitative technique to perform line balancing.
8. What are the activities of a dispatcher? Explain the dispatching procedure in detail.



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R07

Set No. 2

IV B.Tech II Semester Supplementary Examinations, July - 2013

PRODUCTION PLANNING & CONTROL

(Mechanical Engineering)

Time : 3 hours

Max. Marks : 80

**Answer any Five Questions
All Questions carry equal marks**

1. Describe the functions of PPC in detail.
2. Discuss the importance of forecasting in a manufacturing industry.
3. Explain ABC and VED analysis with examples.
4. Discuss the principle of ERP with an illustration.
5. Describe procedural steps involved in routing in a mass production.
6. Discuss various scheduling techniques with their relative merits and demerits.
7. What is meant by aggregate planning? How do you handle fluctuations in demand in aggregate planning?
8. What are the functions of expediting? Explain the expediting procedure in detail.



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Set No. 3

IV B.Tech II Semester Supplementary Examinations, July - 2013

PRODUCTION PLANNING & CONTROL

(Mechanical Engineering)

Time : 3 hours

Max. Marks : 80

**Answer any Five Questions
All Questions carry equal marks**

1. What are the elements of production control? Explain them in detail.
2. Describe the advantages and disadvantages of exponential smoothing method.
3. a) What are the functions of inventories? Explain.
b) Explain the relevant inventory costs.
4. Discuss the principle of LOB with an illustration.
5. What do you mean by bill of material? Explain it with an example.
6. Discuss various scheduling methods with their relative merits and demerits.
7. What is chase planning? Explain its importance.
8. What do you mean by follow-up? What are its types?



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Set No. 4

IV B.Tech II Semester Supplementary Examinations, July - 2013

PRODUCTION PLANNING & CONTROL

(Mechanical Engineering)

Time : 3 hours

Max. Marks : 80

**Answer any Five Questions
All Questions carry equal marks**

1. a) What are the types of production? Explain.
b) Discuss the internal organization of department.
2. Describe any one qualitative forecasting method with its merits and demerits.
3. What is an EOQ model? Discuss its significance. Derive the equation for EOQ.
4. Discuss the important features of JIT.
5. Explain the merits and demerits of i) FCFS and ii) Least Slack policies.
6. a) Bring out the differences between routing and loading.
b) Discuss the routing procedure in a mass production industry.
7. Describe the reasons for existence of dispatching.
8. Discuss the role of computers in production planning and control in detail.



Code No: K0421

R07

Set No. 1

IV B.Tech II Semester Supplementary Examinations, July - 2013

Optical Communications

(Electronics and Communication Engineering)

Time : 3 hours

Max. Marks : 80

Answer any Five Questions
All Questions carry equal marks

- 1 a) Define an optical fiber, what are different types of optic fibers? Explain in detail and draw relevant sketches? [6]
b) Explain in detail the concept of total internal reflection and also discuss the concept polarization? [6]
c) A single mode step index fiber has a core diameter of $8\ \mu\text{m}$ and core refractive index of 1.5. Estimate the shortest wavelength of light which allows single mode operation when the refractive index difference for the fiber is 1%. [4]
- 2 a) What are different fiber materials used in optical communications? Explain. [6]
b) Explain the mechanism of intermodal dispersion in a multimode step index fiber? [6]
c) A graded index fiber has a core with a parabolic refractive index profile, which has a diameter of $50\ \mu\text{m}$. The fiber has a numerical aperture as 0.02. Estimate the total number of guide modes propagating in the fiber when it is operating at a wavelength of $1\ \mu\text{m}$. [4]
- 3 a) A multi mode graded index fiber exhibits the pulse broadening of $0.3\ \mu\text{s}$ over a distance of 25Km. Estimate,
(i) Optimum bandwidth of the fiber
(ii) Dispersion per unit length
(iii) Band width length product [8]
b) Discuss clearly the group delay phenomenon in fiber optics? [8]
- 4 a) What do you mean by splicing? Clearly explain fusion splicing with relevant diagrams? [8]
b) Discuss external quantum efficiency and resonant frequencies of LASER diodes [8]



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Set No. 1

- 5 a) Explain clearly the concept of equilibrium numerical aperture and also show the variation of Numerical Aperture (NA) with fiber length [6]
b) Write short notes on power coupling from a Vertical Cavity Surface Emitting Laser (VCSEL) diode to a single mode fiber? [6]
c) An APD has a quantum efficiency of 40% at $0.80\mu\text{m}$. When illuminated with radiation of this wavelength it provides an output photocurrent of $12\mu\text{A}$ after avalanche gain with a multiplication factor of 240. Calculate the received optical power to the device. How many photons per second does this correspond to? [4]
- 6 a) Compare and contrast different photo detectors [8]
b) Discuss in detail the working principle of PIN Photodiode using suitable diagrams and characteristics [8]
- 7 a) What are the various system considerations in the design of a fiber optic link? Discuss. [8]
b) Explain clearly the rise time budget with the help of a suitable example. [8]
- 8 a) Describe eye pattern analysis for assessing the performance of digital fiber optic link. [5]
b) Compare the advantages and disadvantages of using WDM in an optical fiber communication system. [5]
c) Write short notes on the following
i) Transmission distance
ii) Line coding [6]



Code No: K0421

R07

Set No. 2

IV B.Tech II Semester Supplementary Examinations, July - 2013

Optical Communications

(Electronics and Communication Engineering)

Time : 3 hours

Max. Marks : 80

Answer any Five Questions

All Questions carry equal marks

- 1 a) Discuss in detail about ray optics? Derive expression for the Numerical Aperture of a step index fiber? [8]
- b) An optical fiber has a NA of 0.20 and a cladding refractive index of 1.6, Determine
 - i) The acceptance angle for the fiber in a medium which has a refractive index of 1.32
 - ii) Critical angle at the core cladding interface. [8]
- 2 a) Explain different types of bending losses in optical fiber. [6]
- b) Explain clearly about different glass fibers and also about plastic optical fiber? [6]
- c) Calculate the core diameter of a single mode fiber propagating light at 1300 nm in which refractive indices of core and cladding are 1.48 and 1.45 respectively. [4]
- 3 a) Distinguish between material dispersion and wave guide dispersion? [8]
- b) Discuss about losses in end separation, connecting different fibers when joining two fibers? [8]
- 4 a) Compare and contrast LASER diodes and LED Diodes. [8]
- b) Derive expression for the LASER diode rate equations. [8]
- 5 a) Compare Lambertian and monochromatic optical sources in terms of power coupling into a single mode fiber. [5]
- b) Briefly explain about source output pattern in power launching from source to fiber. [5]
- c) A Ga As source of 220 μm diameter active area and refractive index of 3.75 radiating into 310 solid angle couples power into an all silica optical fiber of 50 μm diameter and 0.22 numerical aperture. Estimate the loss in power coupling due to all types of mismatch between the devices. Calculate the loss computed in dB. [6]



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Set No. 2

- 6 a) Draw and Explain basic components of a digital optical fiber communication receiver. [6]
b) What are the requirements of photo detector and why photodiode is preferred in fiber optic communication system as detector? [5]
c) Compare and contrast a PIN diode detector and an APD detector. [5]
- 7 a) Discuss the effect of mode mixing factor on modal dispersion for calculating the maximum allowable transmission data rate in a fiber optic link. [8]
b) Describe the procedure to determine the maximum allowed NRZ or RZ data rate on a given fiber optic link. [8]
- 8 a) Compare and contrast intermodal and intramodal dispersion? [6]
b) Explain how noise margin and best sampling time can be estimated by observing the eye pattern in a digital optical transmission system. [4]
c) Write short notes on the following
i) Eye pattern
ii) WDM [6]



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R07

Set No. 3

IV B.Tech II Semester Supplementary Examinations, July - 2013

Optical Communications

(Electronics and Communication Engineering)

Time : 3 hours

Max. Marks : 80

Answer any Five Questions
All Questions carry equal marks

- 1 a) What is an optical fiber? Distinguish between step index fiber and graded index fiber with neat diagrams. [5]
b) Derive expressions for the numerical aperture of step index and graded index fibers based on their fiber structure? [5]
c) Light traveling in air strikes glass at an angle of $\theta_1 = 33^\circ$ where θ_1 is measured between incoming ray and glass surface. Part of beam is reflected and part is refracted. If the refracted and reflected beam make an angle of 90° with each other, what is the refractive index of glass? What is the critical angle of the glass? [6]
- 2 a) What are the basic attenuation mechanisms in the optical fiber communication? Explain in brief on what factors this mechanism depend upon? [6]
b) Explain in detail about signal distortion and attenuation in optical fiber? [6]
c) Determine the cut off wavelength for a single mode optical fiber of $5 \mu\text{m}$ core radius, having a core refractive index of 1.450. Take $\Delta = 0.002$. [4]
- 3 a) Compare and contrast dispersive and non dispersive mediums with respect to optical parameters of free space? [8]
b) What do you mean by splicing? Clearly explain mechanical splicing with relevant diagrams? [8]
- 4 a) List out the advantages and discuss in detail the semiconductor injection LASER. [8]
b) Derive expression for the LASER diode rate equations. [8]
- 5 a) What are the factors involved in launching optical power from a light source to a optical fiber? [8]
b) For an optical source having refractive index of 3.5 coupled to a fiber with refractive index of 1.46. Considering that the medium between fiber and source has similar index as that of fiber. Calculate Fresnel reflection and loss of power in dBs. [8]



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Set No. 3

- 6 a) Explain the following photodiode parameters
- i) Quantum efficiency
 - ii) Dark current
 - iii) Sensitivity
 - iv) Bit error rate
- [10]
- b) Compute the range of quantum efficiency of an InGas PIN diode in the wavelength range between 1200 nm and 1600 nm if the responsivity of the diode is specified to be more than 0.6 A/W in the required wavelength region. Use the following physical constants listed below.
- Speed of light in vacuum = 3×10^8 m/s
Electron charge = 1.602×10^{-19} C
Planck's constant = 6.6256×10^{-34} J-S
Boltzman's constant = 1.38×10^{-23} J/K
Band gap energy of Gas = 1.15 eV at 300K.
- [6]
- 7 a) Explain clearly the link power budget with the help of an example. [8]
- b) Compare dispersion limited and an attenuation limited fiber optic links. [8]
- 8 a) Explain the principles of the WDM technique? What are its advantages? How is it different from FDM technique? Discuss. [8]
- b) With the help of suitable diagram, illustrate the measurement of fiber attenuation using cutback technique? [8]



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R07

Set No. 4

IV B.Tech II Semester Supplementary Examinations, July - 2013

Optical Communications

(Electronics and Communication Engineering)

Time : 3 hours

Max. Marks : 80

Answer any Five Questions
All Questions carry equal marks

- 1 a) Draw different elements of a typical Optical Communication system and explain each? [8]
b) Compare and contrast optical fiber communication system and conventional communication system? List out the advantageous and disadvantage of optical fiber communication system? [8]
- 2 a) A graded index fiber with a parabolic refractive index profile core has a refractive index at the core axis of 1.49 and a relative index difference of 1%. Estimate the maximum possible core diameter which allows single mode operation at a wave length of $1.32\mu\text{m}$? [8]
b) What are different types of fiber optic connectors? Explain about fiber optic connectors in detail. [8]
- 3 a) What are different types of dispersions in single mode optical fibers? Explain. [8]
b) Discuss the pulse broadening due to dispersion in optic fibers with the help of neat diagrams? [8]
- 4 a) Discuss the major requirements of an optical source for use in optical communication systems? [8]
b) What is population inversion and how it can be achieved? Discuss the requirements of population inversion in order that stimulated emission may dominate over spontaneous emission. Illustrate with the help of energy level diagram of laser? [8]



Code No: K0421

R07

Set No. 4

- 5 a) Discuss how the lensing schemes are useful for coupling efficiency improvement in LEDs . [6]
b) Discuss in detail about the laser diode-to-fiber coupling. [5]
c) An LED with circular emission region of diameter 200 μm and an axial radiance of 100 W / $\text{cm}^2\text{-Sr}$ at 100mA drive current is coupled into a step index fiber of 50 μm radius and of 0.22 numerical aperture. Compute the power coupled into this step index fiber. Compute the % difference in coupled power if the radius of the fiber is halved. [5]
- 6 a) Explain the performance of a digital receiver and derive expression for the probability of error. [8]
b) Draw and explain the working of an avalanche photodiode. [8]
- 7 a) Discuss the choice of different components in designing an optical fiber link and explain the shortcomings of each component. [8]
b) Draw and explain the point-to-point optical link. [8]
- 8 a) Draw and explain about the optical attenuation meter? [8]
b) A spot measurement of fiber attenuation is performed on a 2.5 km length of optical fiber at a wavelength of 1.2 μm . The measured optical output power from the 2.5 km length of fiber is 50.5 μW . When the fiber is cutback to 3m length, the measured optical power is 395.4 μW . Determine the attenuation per kilometer for the fiber at a wavelength of 2.1 μm . [8]



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R07

Set No. 1

IV B.Tech II Semester Supplementary Examinations, July - 2013

MANAGEMENT SCIENCE

(Common to Computer Science & Engineering and Information Technology)

Time : 3 hours

Max. Marks : 80

**Answer any Five Questions
All Questions carry equal marks**

1. a) Define Management? Explain its significance and importance?
b) Management is an Art or Science? Discuss?
2. a) Explain the types of Organization Structure and Importance?
b) How to design the Organization Structure?
3. a) Explain the Principle considerations for location of a Plan?
b) Explain the Procedure and Techniques used in Plant Layout?
4. Define Inventory Control? What are the basic functions of Inventory Control and also explain its importance?
5. Define Marketing? Explain its significance and functions of Marketing?
6. a) Discuss the Major Functions of Human Resource Management?
b) Briefly Explain Human Resource Planning?
7. Explain the role of CPM in Project Planning and scheduling?
8. Write short notes on
 - a) Work Sampling
 - b) Just- In- Time (JIT)



Code No: L0521

R07

Set No. 2

IV B.Tech II Semester Supplementary Examinations, July - 2013

MANAGEMENT SCIENCE

(Common to Computer Science & Engineering and Information Technology)

Time : 3 hours

Max. Marks : 80

Answer any Five Questions
All Questions carry equal marks

1. a) What are the functions of the Manager?
b) Explain the difference between Theory X and Theory Y
2. a) What is Line and Staff Organisation?
b) Explain matrix organization with an example.
3. a) Define Plant Lay out. Explain the principles of plant layout.
b) What is the importance of the Control Chart?
4. What is Product cycle? Explain the different stages in product cycle.
5. What is the difference between Recruitment and Selection? What are the difference steps involved in Recruitment and Selection?
6. a) Explain the importance of critical path with an example?
b) Explain the various differences between PERT and CPM.
7. What is SWOT analysis? Explain its role in strategy formulation.
8. Write short notes on
 - a) MIS
 - b) JIT
 - c) MRP



Code No: L0521

R07

Set No. 3

IV B.Tech II Semester Supplementary Examinations, July - 2013

MANAGEMENT SCIENCE

(Common to Computer Science & Engineering and Information Technology)

Time : 3 hours

Max. Marks : 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. a) What is Hawthorne Experiments? Explain its importance in Fayol's Principles
b) Explain various leadership styles.
2. a) Differentiate Virtual Organization and Cellular Organization
b) What are the important characteristics of pyramid structure?
3. Define Work Study. What are the steps involved in method study?
4. What is Marketing Mix? Explain in detail with an example?
5. What is difference between Personnel Management and HRM? Explain the different stages in developing Personnel Management in to HRM
6. What are problems involved in formulating and implementing a strategy for a large corporate company?
7. What is Six Sigma? Explain the importance of Capability Maturity Model.
8. The various time estimates of activities involved in a project are given below:
 - a) Identify the Critical path and Project duration
 - b) Determine the probability factor of completing the project in 30days

| Activity | To | Tm | Tp |
|----------|----|----|----|
| 1-2 | 4 | 12 | 10 |
| 1-3 | 8 | 16 | 24 |
| 2-4 | 4 | 6 | 8 |
| 3-4 | 5 | 8 | 14 |
| 3-5 | 0 | 0 | 0 |
| 4-6 | 10 | 14 | 20 |
| 5-6 | 2 | 6 | 10 |



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Set No. 4

IV B.Tech II Semester Supplementary Examinations, July - 2013

MANAGEMENT SCIENCE

(Common to Computer Science & Engineering and Information Technology)

Time : 3 hours

Max. Marks : 80

**Answer any Five Questions
All Questions carry equal marks**

- 1 a) What is the difference between Management and Administration?
b) Explain the role of social responsibility of the Management in Corporate sector.
- 2 a) Suggest which type of Organization Structure is suitable to a Soft ware Company.
b) What are the principles to be considered to design an Organization Structure?
- 3 a) What is difference between Job production and batch production?
b) What are the different Statistical Quality Control techniques used in Control the quality of the product?
- 4 a) Explain the Economic Order Quantity with an example.
b) What are the different Channels of distribution used in reaching the product the customer?
- 5 What is Grievance Handling ? Explain difference approaches in Grievance Handling.
- 6 a) Discuss various methods of Training.
b) Explain the different methods of Performance appraisal methods.
- 7 What is Value Chain Analysis? Explain its role in formulating the strategy.
- 8 The various time estimates of activities involved in a project are given below:
 - a) Construct net work diagram
 - b) Identify the Critical path and Project duration
 - c) Determine the probability factor of completing the project in 25 days

| Activity | To | Tm | Tp |
|----------|----|----|----|
| 1-2 | 2 | 5 | 8 |
| 1-3 | 4 | 8 | 12 |
| 2-4 | 5 | 9 | 13 |
| 3-4 | 1 | 3 | 9 |
| 3-5 | 3 | 6 | 9 |
| 4-6 | 7 | 12 | 18 |
| 5-6 | 5 | 10 | 15 |

