

**SECTION – A**

There are **FOUR** questions in this section. Answer any **THREE**.

1. (a) What are the functional differences between engine lathes and turret lathes? Mention their relative advantages and disadvantages. (15)  
 (b) How are principal movements different from feed and auxiliary movements in case of machine tools? Provide the names of principal and feed movements available in an engine lathe? For the kinematic diagram shown in Fig. for Q1, write the kinematic equations of short and long gear trains used for spindle rotation. Also, determine different RPMs available on the lathe machine. (15)  
 (c) Using the kinematic diagram of an engine lathe shown in Fig. for Q1, briefly, discuss the process of cutting metric threads with standard pitches and provide the kinematic balance equations. (16 $\frac{2}{3}$ )
  
2. (a) Classify milling machines. Give some examples of surfaces that can be produced using milling machines. Provide necessary sketches. (20)  
 (b) Briefly, explain the steps for making helical grooves using universal knee and column type milling machine. Using a kinematic diagram, discuss how dividing head is connected with the table lead screw and the workpiece. (26 $\frac{2}{3}$ )
  
3. (a) Making gears by a gear shaper machine is a generating methods — Do you agree? Explain why. (10)  
 (b) Provide the main specifications of a typical gear shaper machine. What is the principal movement in gear shaper machine? Do we need any auxiliary movement for cutting spur gear using the gear shaper machine? Explain with sketches. (20)  
 (c) Which mechanism is used to make helical grooves in gear shaper machine? Discuss in short with necessary drawing. (16 $\frac{2}{3}$ )
  
4. Write short notes on: (46 $\frac{2}{3}$ )
  - (a) Quick return mechanism
  - (b) Differences between shaper and planer machines.
  - (c) Functions of the hydraulic system in a grinding machine.
  - (d) Differential indexing.

**IPE 401**

**SECTION – B**

There are **FOUR** questions in this section. Answer any **THREE**.

5. (a) With schematic diagram give a brief description of anti-friction slide-ways. Also specify its advantages and disadvantages. (15)
- (b) Provide some specific logics to prove the advantages of hydraulic drive over mechanical drive. (15)
- (c) How speed in cone pulley drive is increased using back gear drive? Explain with schematic diagram. (16 $\frac{2}{3}$ )
6. (a) What are the basic principles of sliding cluster gears? State the two rules and prove second rule with necessary diagrams. (15)
- (b) Prove the kinematic energy of gearbox is proportional to the cube of the diameter of gear and directly proportional to the speed. (16 $\frac{2}{3}$ )
- (c) How does a directional control valve work? (15)
7. (a) Formulate the equations to calculate the force acting on the slide-ways of lathe machine. Draw necessary diagrams to formulate the equations. (20)
- (b) Prove that, progression ratio for GP series is constant. (10 $\frac{2}{3}$ )
- (c) Show that, for a given AP series the maximum loss in cutting speed is a function of diameter machined. (16)
8. (a) For  $Z = 3.3.2$  draw 3 ray diagrams and calculate the speeds when input speed is 1400 r.p.m. and transmission ratio  $\phi = 1.4$ . (18)
- (b) How can 3 cluster gears of size two and three be arranged to get twelve different speeds? Draw schematic diagrams to show all twelve combinations. (18 $\frac{2}{3}$ )
- (c) Write down the mechanism and advantages of recirculating ball nut. (10)
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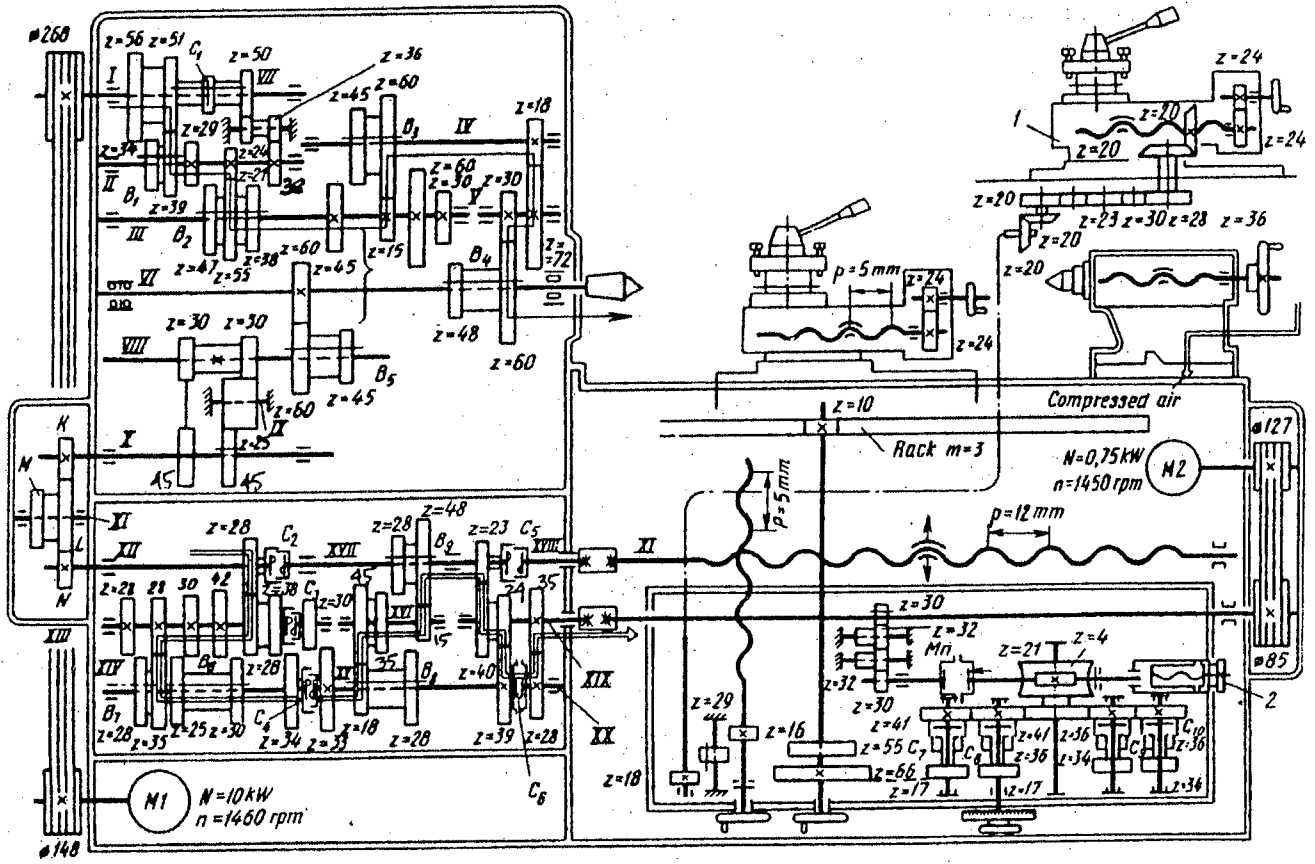


Fig. for Q.1

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-2 B. Sc. Engineering Examinations 2015-2016

Sub : **IPE 427** (Marketing Management)

Full Marks: 210

Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

**SECTION – A**

There are **FOUR** questions in this section. Answer any **THREE**.

1. (a) How a business market is different from a consumer market in its buying process and priorities? Explain. (12)  
(b) Briefly discuss the importance of identifying roles of different participants and their influences in the buying process of business market. (15)  
(c) Mention the importance of maintaining customer relationships in business markets. (08)
2. (a) Suppose, a company is planning to launch a new chocolate in the market. Briefly describe the market segmentation process for this upcoming product. (13)  
(b) Explain Michael Porter's five forces that determine the long-run attractiveness of a market segment. (12)  
(c) How you can evaluate and select different market segments to target initially? (10)
3. (a) The company 'H' is a market leader in the consumer electronics market. Discuss competitive strategies of this company to retain and extend its leadership. (16)  
(b) Explain how competitive strategies change over the life cycle of a product. (14)  
(c) What are the strategies that can be implemented to be a market leader in a small market or niche? (05)
4. (a) Explain the importance of product and service differentiation for a product to be successful in the target market. (10)  
(b) Define different ways of extending a product line. (08)  
(c) Briefly describe different alternative objectives of pricing decision. Define value pricing. (12+05=17)

**IPE 427**

**SECTION-B**

There are **FOUR** questions in this section. Answer any **THREE** questions.

5. (a) Differentiate among need, want and demand. (5)  
(b) Describe the portfolio-planning method developed by the Boston Consulting Group. (8)  
(c) Describe cultural factors that influence consumer buying behavior. (10)  
(d) Explain different concepts under which organizations design and carry out their marketing strategies. (12)
6. (a) Define marketing mix. Explain different components of marketing mix. (15)  
(b) How could you define consumer behavior? Briefly describe the personal characteristics that have very direct impact on consumer behavior (20)
7. (a) Explain the role played by a family in consumer buying decisions. (5)  
(b) Explain how consumer goods can be classified. (10)  
(c) Explain how changes in the demographic and economic environments affect marketing decisions. (20)
8. (a) Discuss the steps which are required for developing marketing strategy and plan. (8)  
(b) "Marketers are keenly interested in the cultural environment because cultural factors strongly affect how people think and how they consume." – Justify this statement. (12)  
(c) Explain the purchase decision process and different post-purchase behavior of a consumer after a purchase decision. (15)
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**SECTION – A**

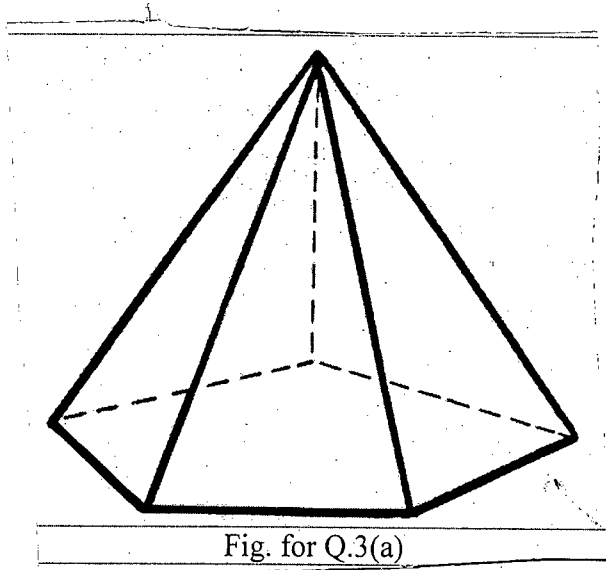
There are **FOUR** questions in this section. Answer any **THREE**.

1. (a) What do you understand by models of the design process? What are the strengths and weaknesses of the conventional design representation? Explain in short. **(10)**
- (b) List names of few geometric entities available in CAD systems. Also, explain different ways for defining these entities in CAD system with necessary sketches. **(10)**
- (c) Classify different types of surfaces based on generating techniques in CAD systems and discuss them with examples. Briefly, explain skinned and lofted surfaces with sketches. **(15)**
  
2. (a) Compare CSG and B-rep solid modeling techniques. With a simple example, discuss how the Boolean intersection, union and difference operations can help to generate a solid model for CSG method. **(15)**
- (b) Provide examples of the explicit equation and implicit equation of a straight line and a conic section curve. Are these equations suitable for CAD system? Explain why. **(10)**
- (c) Why is cubic polynomial very popular for three-dimensional modeling? With necessary drawings and equations, compare the basis/blending functions for Hermit and Bezier cubic curves. **(10)**
  
3. (a) Explain the rules used for examining the topological consistency of a solid model with necessary sketches. Show that 3D model shown in Fig. for Q.3(a) is topologically consistent. **(20)**
- (b) A circle of radius 25.0mm, centered at  $X = 100.0$ ,  $Y = 150.0$  is to be drawn as a series of lines by a two-dimensional drafting system. If maximum display tolerance is 5.0 mm, calculate the number of lines required to display the circle within this tolerance, and calculate the screen coordinates of at least one line. Here the window bounds are (40.0, 100.0) and (160.0, 200.0) and viewport bounds are at pixel locations (0, 50), (480, 450). **(15)**
  
4. (a) What are the facilities that are typically provided for manipulation of the model in CAD systems? Briefly, explain. Discuss the limitations of currently available CAD systems. **(15)**

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**Contd... Q. No. 4(b)**

(b) What are the requirements for a data structure of CAD systems to support interactive modeling? Give an example of how CAD systems store the model on which model creation and manipulation algorithm act. (20)



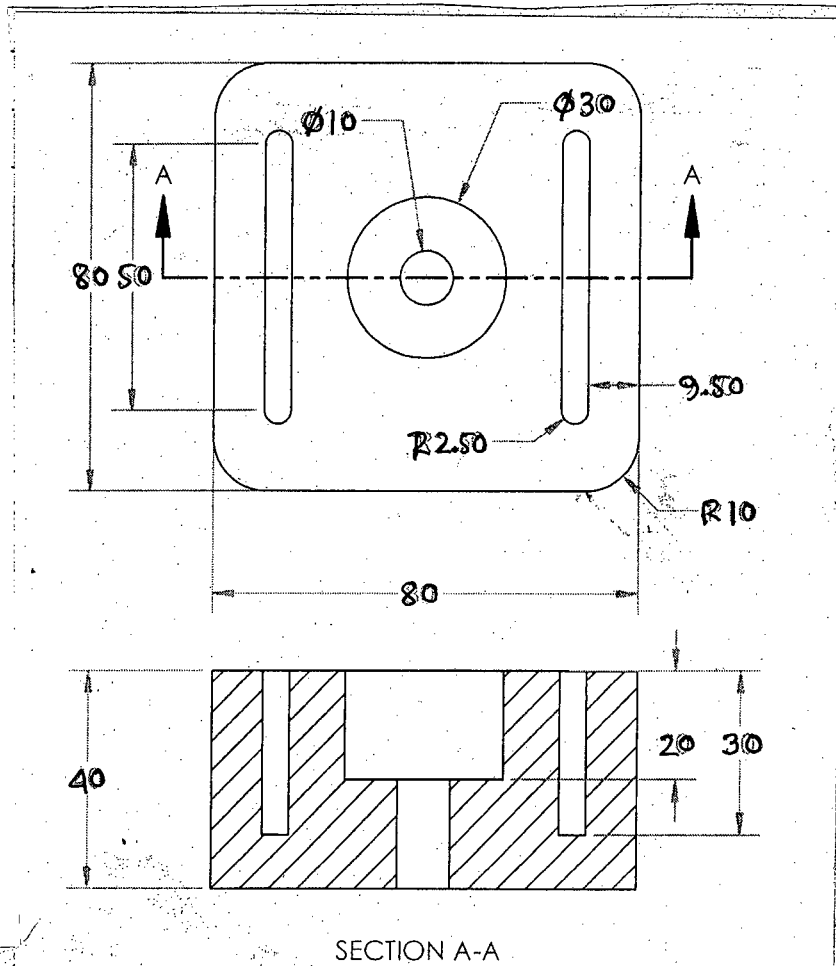
**SECTION-B**

There are **FOUR** questions in this section. Answer any **THREE**

5. (a) Mention the benefits of DNC over CNC. How can you compare DNC with NC machine? (8)
- (b) Distinguish 5-axis CNC machining center from 6-axis CNC machining center. Discuss the contribution of the extra axis in complex part manufacturing. (7)
- (c) Briefly explain two different types of tool holders for CNC spindle attachment. Indicate the benefits of one compared to the other one. (10)
- (d) With neat sketch, explain the working principles of different types of "Pallet work changer" for CNC machining center. (10)
  
6. (a) What are the three different tool positioning modes in CNC technology? Provide example for each mode. (8)
- (b) G-28 is a "Non-modal" command – justify. (5)
- (c) How can you compare Electronic edge finder with Probe type edge finder based on their working principles? (7)
- (d) Write a G-code for machining the post in Fig Q 6(d): (15)

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Contd... Q. No. 6 (d)

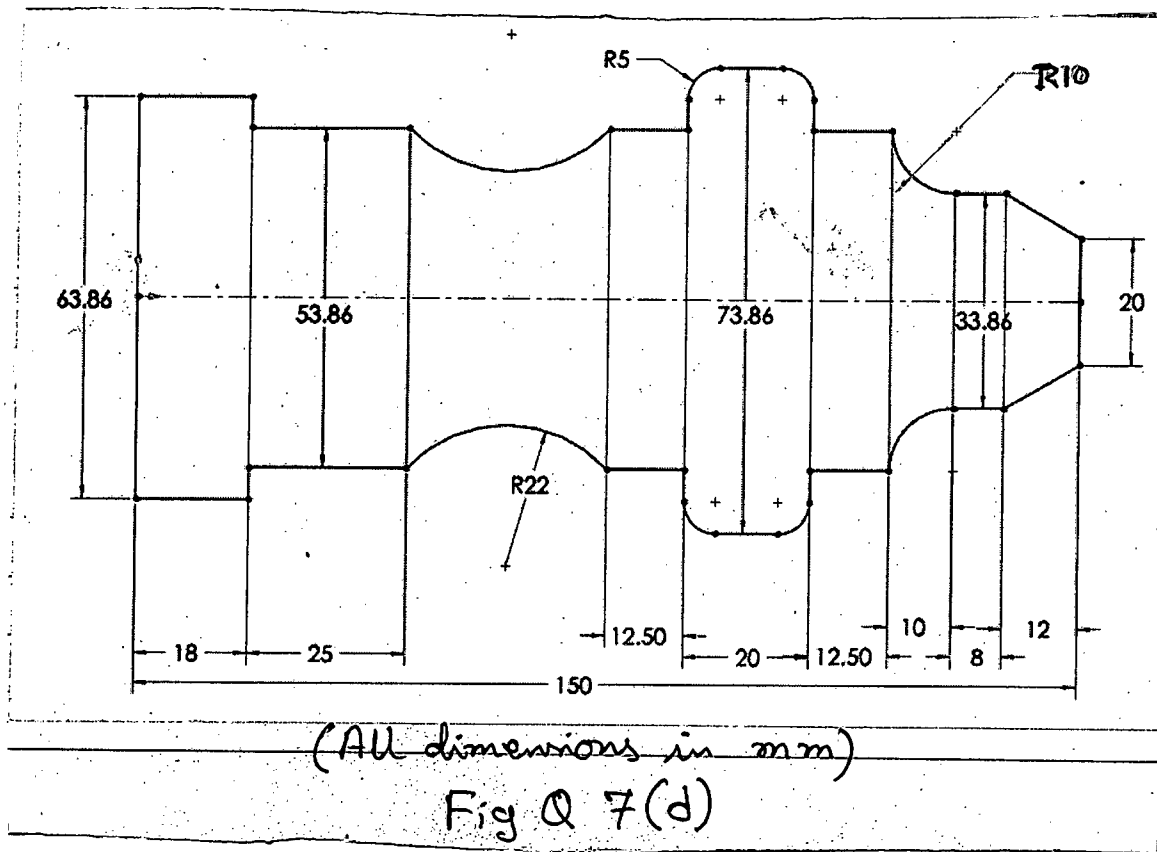


(All dimensions in mm ; Use any suitable tool)  
Fig Q 6 (d)

- 7. (a) CNC technology prefers Ball bearing leadscrew over ACME leadscrew – explain with neat sketches. (8)
- (b) During travelling a curved path, the cutter cuts either under or overcut. That is why, tool paths are different for concave and convex surface machining to compensate that over cut or undercut – discuss. (8)
- (c) What are the three different operating modes for CMM? Mention the factors affecting the accuracy in measuring a complex component. (8)
- (d) Write a G-code for turning the part in Fig. Q. 7 (d). (11)



IPE 409



8. Write short notes on the following:
- (a) Pure primitive instancing
  - (b) Object transformation
  - (c) DXF format
  - (d) Drawbacks of a raster-type display
  - (e) Spatial occupancy enumeration.

(5×7=35)

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List of G-code for CNC Milling/Turning Operations

| G-code | Description                             |
|--------|---|
| G00    | Rapid traverse                          |
| G01    | Linear interpolation                    |
| G02    | Clockwise circular interpolation        |
| G03    | Counterclockwise circular interpolation |
| G20    | Inch data input                         |
| G21    | Metric data input                       |
| G28    | Automatic return to the reference point |

| G-code | Description                               |
|--------|---|
| G40    | Tool (nose) radius compensation cancel    |
| G41    | Tool (nose) radius compensation left      |
| G42    | Tool (nose) radius compensation right     |
| G54-59 | Workpiece coordinate system 1-6 selection |
| G90    | Absolute command programming              |
| G91    | Incremental command programming           |
| G92    | Zero offset setting                       |

| G-code | Description                             |
|--------|---|
| G50    | Maximum spindle speed command           |
| G80    | End of shape designation                |
| G81    | Start of longitudinal shape designation |
| G82    | Start of traverse shape designation     |

| G-code | Description                      |
|--------|----------------------------------|
| G85    | Call for rough bar turning cycle |
| G87    | Call for finishing turning cycle |
| G96    | Constant cutting speed           |
| G97    | Fixed RPM                        |

List of M-code for CNC Milling/Turning Operations

| M-code | Description              |
|--------|--------------------------|
| M02    | End of program           |
| M03    | Spindle clockwise        |
| M04    | Spindle counterclockwise |
| M05    | Spindle stop             |

| M-code | Description        |
|--------|--------------------|
| M06    | Tool change        |
| M08    | Coolant on (spray) |
| M09    | Coolant off        |
| M30    | End of program     |

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-2 B. Sc. Engineering Examinations 2015-2016

Sub : **IPE 411** (Industrial and Business Management)

Full Marks : 210

Time : 3 Hours

The figures in the margin indicate full marks.

USE SEPARATE SCRIPTS FOR EACH SECTION

**SECTION – A**

There are **FOUR** questions in this section. Answer any **THREE**.

1. (a) Differentiate efficiency and effectiveness with suitable examples in the view of a manager. (10)
- (b) Explain the significance of planning as one of the very important management functions to achieve success. (10)
- (c) Explain how you can apply the management principles of Henry Fayol in today's context for successfully performing management functions. (15)
  
2. (a) Differentiate the classical and the behavioral approaches of management. (10)
- (b) Discuss how goal-setting and reinforcement theories explain employee motivation. (12)
- (c) Many job design experts who have studied the changing nature of work say that people do their best work when they are motivated by a sense of purpose rather than by the pursuit of money. Do you agree? Explain your position. (13)
  
3. (a) Explain Fiedler's contingency model of leadership. (15)
- (b) A study showed that CEOs of many successful companies have hard-nosed personal traits, such as persistence, efficiency, attention to detail, and a tendency to set high standards, rather than softer strengths, such as teamwork, enthusiasm, and flexibility. How would you explain this in light of the leadership theories that you have studied in this course? (15)
- (c) What are the factors that determine the span of a management? (05)
  
4. (a) Explain the challenges in developing a fair performance appraisal system. (12)
- (b) 'Performance appraisal is a powerful motivating tool' - Explain your opinion. (10)
- (c) Briefly describe the current challenges of a manager. (13)

**IPE 411**

**SECTION – B**

There are **FOUR** questions in this section. Answer any **THREE**.

5. (a) Describe the three major types of corporate strategies. (20)  
(b) Explain the contingency factors that affect organizational design. (15)
6. (a) "Mechanistic structure paves the way for creativity and freedom of employees" - do you agree? Justify your opinion. (10)  
(b) Briefly explain the significance of orientation programs for newly recruited employees. (10)  
(c) Discuss the environmental factors that most directly affect the HRM process. (15)
7. (a) Explain different components of the team-effectiveness model. (15)  
(b) Depict a practical scenario where performance simulation is more appropriate than conventional written examination as a selection device. (10)  
(c) Compare different types of organizational communication networks. (10)
8. (a) Write short notes on competitive advantage and SWOT analysis. (15)  
(b) Briefly describe the interpersonal communication process. (10)  
(c) Mention different types of departmentalization. Differentiate product departmentalization from process departmentalization. (10)
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