Subject Code: R13106/R13 **Set No - 1**

I B. Tech I Semester Regular Examinations Feb./Mar. - 2014

ENVIRONMENTAL STUDIES

(Common to CE, ME, CSE, PCE, IT, Chem E, Aero E, AME, Min E, PE, Metal E)

Time: 3 hours **Max. Marks: 70**

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**

*****

PART-A

1.(i) What are the causes of floods and droughts?
(ii) What are ecological pyramids? Write about different types of pyramids
(iii) Write about different values of biodiversity.
(iv) Write about Bhopal gas tragedy.
(v) What is wild life protection act?
(vi) Write about ecotourism.

[4+4+5+4+3+2]

PART-B

2.(a) Define biodiversity. Write about threats of biodiversity.
(b) Write about EIA, its significance at various stages.

[8+8]

3.(a) Why should public have awareness about Environmental protection acts?
(b) What are greenhouse gases?
(c) Write about rain water harvesting.

[6+5+5]

4.(a) What is Environmental audit? Explain.
(b) Write about Grassland ecosystem and Aquatic ecosystem

[4+12]

5.(a) Write about different types of energy resources.
(b) What is the role of an individual in conservation of natural resources.
(c) What are the hot spots of biodiversity?

[4+4+8]

6.(a) Discuss the causes and effects of global warming
(b) Distinguish between renewable and non- renewable resources

[8+8]

7.(a) Mention about different types of pollution briefly.
(b) Discuss about Environmental ethics and issues connected there on.

[6+10]

Subject Code: R13106/R13 **Set No - 2**

I B. Tech I Semester Regular Examinations Feb./Mar. - 2014

ENVIRONMENTAL STUDIES

(Common to CE, ME, CSE, PCE, IT, Chem E, Aero E, AME, Min E, PE, Metal E)

Time: 3 hours **Max. Marks: 70**

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**

*****

PART-A

1.(i) Write about soil pollution and causes of soil degradation.
(ii) Give the salient features of a pond ecosystem
(iii) What is meant by species Biodiversity?
(iv) What are the causes of deforestation?
(v) Write the various stages of EIA.
(vi) Write a report on any Environmental issue which you have studied.

[4+4+4+3+3+4]

PART-B

2.(a) Distinguish between food chain and food web.
(b) Discuss about EMP (Environmental Management Plan)

[8+8]

3.(a) What are the three levels of biodiversity?
(b) Mention about different types of mining and effects of mining?

[8+8]

4.(a) Name different types of pollution.
(b) Give an account of energy flow in an ecosystem.
(c) Write about Environmental Waste Products and their disposal

[2+8+6]

5.(a) Write about producers, consumers and decomposers.
(b) What is the extinction of species? Describe the processes which lead to extinction of species.

[8+8]

6.(a) Discuss the salient features of The environment protection act ,1986.
(b) Write about greenhouse gases and ozone layer.

[8+8]

7.(a) Write about role of IT in Environment and human health.
(b) What is the significance of rain water harvesting?
(c) Write about ecotourism?

[6+6+4]

Subject Code: R13106/R13 **Set No - 3**

I B. Tech I Semester Regular Examinations Feb./Mar. - 2014

ENVIRONMENTAL STUDIES

(Common to CE, ME, CSE, PCE, IT, Chem E, Aero E, AME, Min E, PE, Metal E)

Time: 3 hours **Max. Marks: 70**

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**

*****

PART-A

1.(i) Write about structure and function of ecosystem.
(ii) Write about the sources of water pollution
(iii) Discuss about benefits of Dam construction.
(iv) Discuss the problems involved in enforcement of Environmental Legislation.
(v) Differentiate between endangered and endemic species.
(vi) Write a note on any polluted site you have visited.

[5+3+4+4+3+3]

PART-B

2.(a) Distinguish between deforestation and desertification.
(b) Write about different energy pyramids.

[8+8]

3.(a) Explain the process of succession in a newly formed pond.
(b) Give an account of crisis and conflicts over water.

[8+8]

4.(a) Name different types of air pollutants and sources of air pollution.
(b) What are the stages involved in EMP and EIS.

[8+8]

5.(a) What are the objectives of wild life protection act?
(b) What do you understand by environmental ethics?
(c) Discuss various methods of safe disposal of solid waste.

[4+4+8]

6.(a) What are the major issues and problems related to Resettlement and Rehabilitation of displaced people.
(b) Write about significance of EIA.
(c) Write about ecotourism?

[8+4+4]

7. Write short note on
(i) Hot Spots of Biodiversity.
(ii) Man and Wildlife conflict.
(iii) Conservation of Biodiversity.

[6+5+5]

Subject Code: R13106/R13 **Set No - 4**

I B. Tech I Semester Regular Examinations Feb./Mar. - 2014

ENVIRONMENTAL STUDIES

(Common to CE, ME, CSE, PCE, IT, Chem E, Aero E, AME, Min E, PE, Metal E)

Time: 3 hours **Max. Marks: 70**

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**

*****

PART-A

1.(i) Write about the sources of air pollution
(ii) What are in-situ and ex-situ conservation?
(iii) Explain the concept of food chain and food web.
(iv) Write about environmental audit?
(v) Discuss energy problems related to urban areas.
(vi) Discuss about conservation of water resources.

[4+5+4+3+3+3]

PART-B

2.(a) What is mining? Describe different methods of mining.
(b) Differentiate between primary succession and secondary succession.
(c) Write about Nuclear hazards.

[6+6+4]

3.(a) Distinguish between renewable and non-renewable resources.
(b) Discuss about Man induced landslides and its effects with case study.

[6+10]

4.(a) What are the sources, effects and control measures of noise pollution.
(b) What is meant by ozone layer? How CFC'S and ozone depleting substances affect ozone layer?

[8+8]

5.(a) Why decomposers are called micro consumers?
(b) What are the various methods of safe disposal of solid waste?
(c) Write about desert ecosystem.

[4+8+4]

6.(a) What is the significance of EIA and the stages involved
(b) 'India is a Biodiversity Nation'. Discuss

[8+8]

7. Write short note on
(i) Values of Biodiversity
(ii) Water Act and Wild life protection Act
(iii) Environmental Legislation.

[4+8+4]

Subject Code: R13109/R13 **Set No - 1**

I B. Tech I Semester Regular Examinations Feb./Mar. - 2014

ENGINEERING DRAWING

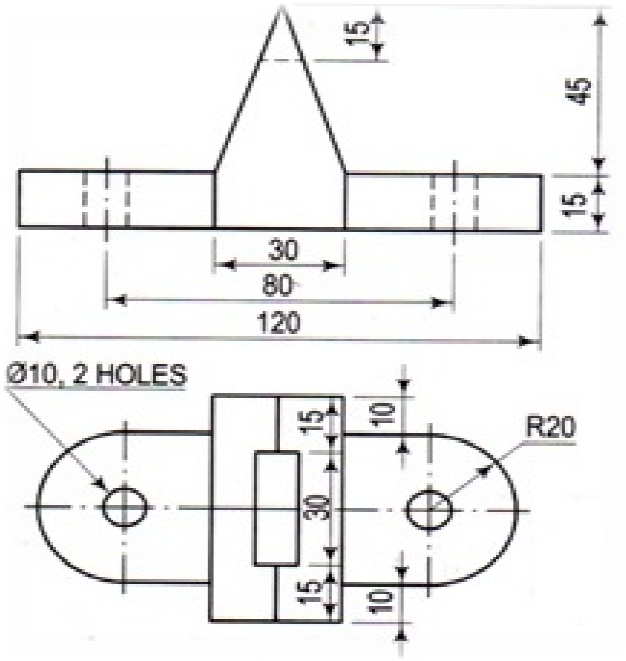
(Common to ECE, EIE, Bio-Tech, EComE, Agri.E)

Time: 3 hours **Max. Marks: 70**

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**
*****

PART-A

1.(a) Draw the isometric view of Fig.1.



Note: All dimensions are in mm.
Fig.1

(b) Draw the projections of the straight line AB of 100 mm length when one of its ends is touching V.P and the other end is touching HP. The angles of inclination with H.P and V.P are 40^0 and 50^0 respectively.

[12+10]

PART-B

2.(a) The area of a field is 50000 sq m. The length and the breadth of the field, on the map is 10 cm and 8 cm respectively. Construct a diagonal scale which can read up to one metre. Mark the length of 235 metre on the scale. What is R.F of the scale?

(b) The foci of an ellipse are 90 mm apart and the minor axis is 72 mm long. Determine the length of the major axis. Construct the ellipse.

[8+8]

|''|'|''|''||'''||'|

3.(a) Two points A and B are in H.P. The point A is 30 mm in front of the V.P while B is behind the V.P. The distance between their projectors is 75 mm and the line joining their top views makes an angle of 45^0 with xy. Find the distance of the point B from the V.P.

(b) A line PQ 40 mm long is parallel to V.P and inclined at an angle of 30^0 to H.P. The lower end P is 15 mm above H.P and 20 mm in front of V.P. Draw the projections of the line.

[8+8]

4. The front view of a line AB measures 65 mm and makes an angle of 45^0 with xy. A is in the H.P and the VT of the line is 15 mm below the H.P. The line is inclined at 30^0 to the V.P. Draw the projections of AB and find its true length and inclination with the H.P. Also locate its H.T.

[16]

5. Draw the projections of the circle of 50 mm diameter resting in the H.P on a point A on the circumference, its plane inclined at 45^0 to the H.P and
(a) The top view of the diameter AB making 30^0 angle with the V.P
(b) The diameter AB making 30^0 angle with the V.P.

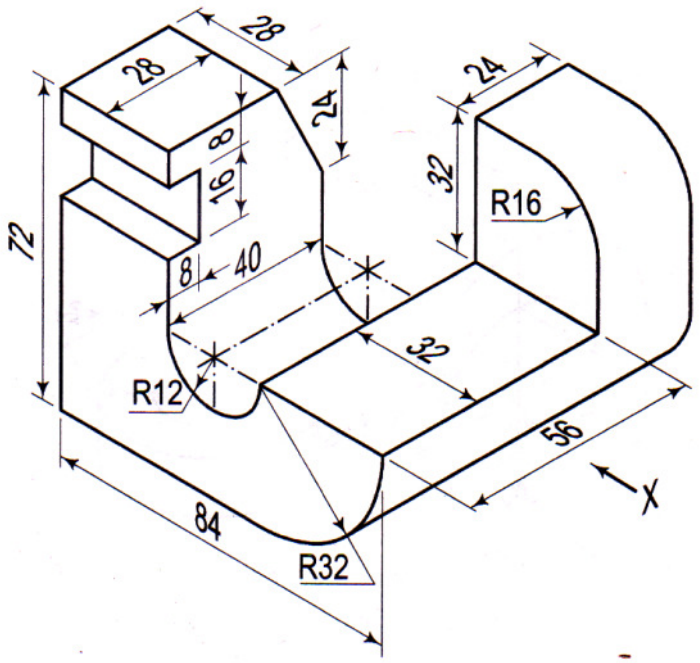
[16]

6. Draw the projections of a cylinder 75mm diameter and 100 mm long, lying on the ground with its axis inclined at 30^0 to the V.P and parallel to the ground.

[16]

7. Draw (i) Front view (ii) Side view from the right (iii) Top view of Fig: 2

[16]



Note: All dimensions are in mm.
Fig: 2

|''|'|''|''||''''||'|

Subject Code: R13109/R13 **Set No - 2**

I B. Tech I Semester Regular Examinations Feb./Mar. - 2014

ENGINEERING DRAWING

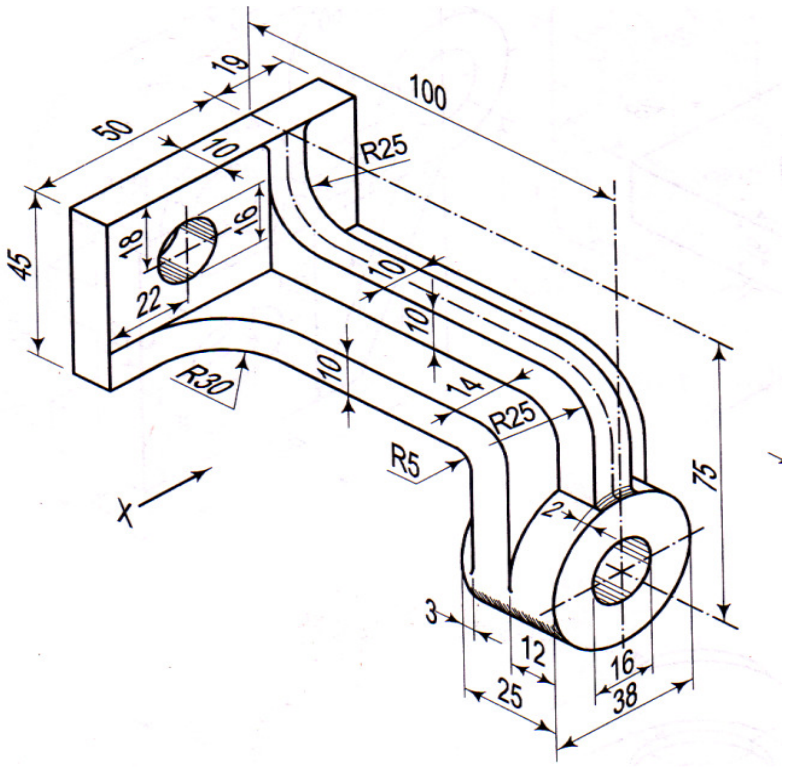
(Common to ECE, EIE, Bio-Tech, EComE, Agri.E)

Time: 3 hours **Max. Marks: 70**

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**
*****

PART-A

1.(a) Draw (i) Front view (ii) Top view of Fig.1.



Note: All dimensions are in mm.
Fig.1

(b) A circular plate of negligible thickness and 50 mm diameter appears as an ellipse in the front view, having its major axis 50 mm long and minor axis 30 mm long. Draw its top view when the major axis of the ellipse is horizontal.

[12+10]

PART-B

2.(a) Construct a vernier scale of R.F=1/80 to read inches and to measure up to 15 yards.
(b) Construct a regular hexagon of side 28 mm when one side is horizontal.

[8+8]

|''|'|''|''||''''||'|

3.(a) The top view of a 75 mm long line measures 55 mm. The line is in the V.P, its one end being 25 mm above the H.P. Draw its projections.

(b) A point P is 15 mm above H.P and 20 mm in front of the V.P. Another point Q is 25 mm behind the V.P and 40 mm below the H.P. Draw projections of P and Q keeping the distance between their projectors equal to 90 mm. Draw straight lines joining (i) their top views and (ii) their front views.

[8+8]

4. A line PQ, 100 mm long, is inclined at 45^0 to the H.P and at 30^0 to the V.P. Its end P is in the second quadrant and Q is in the fourth quadrant. A point R on PQ, 40 mm from P is in both the planes. Draw the projections of PQ.

[16]

5. Draw the projections of a regular hexagon of 25 mm side, having one of its sides in the H.P and inclined at 60^0 to the V.P and its surface making an angle of 45^0 with the H.P.

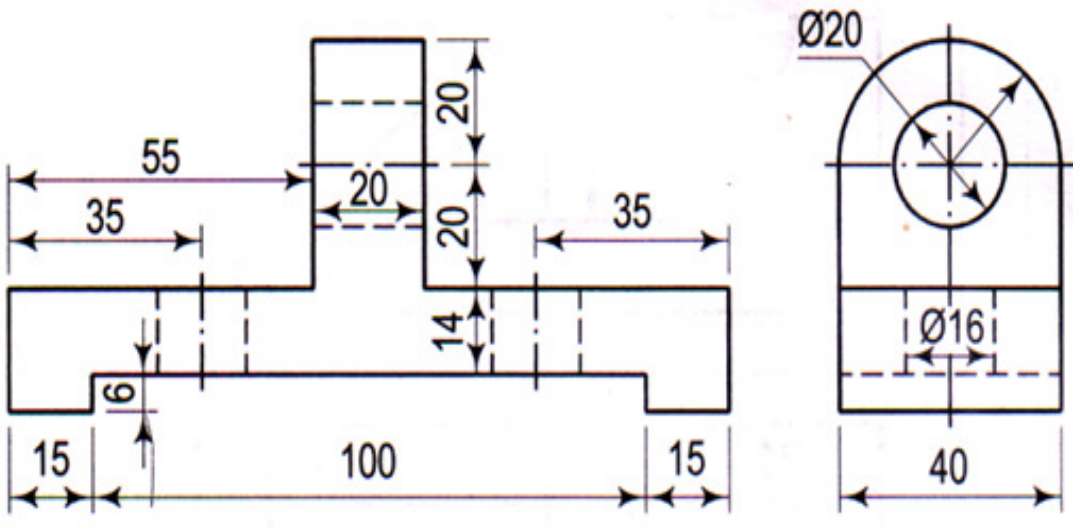
[16]

6. Draw the projections of a cone, base 75 mm diameter and axis 100 mm long, lying on the H.P on one of its generators with the axis parallel to the V.P.

[16]

7. Draw the isometric view of Fig.2:

[16]



Note: All dimensions are in mm.

Fig.2

Subject Code: R13109/R13 **Set No - 3**

I B. Tech I Semester Regular Examinations Feb./Mar. - 2014

ENGINEERING DRAWING

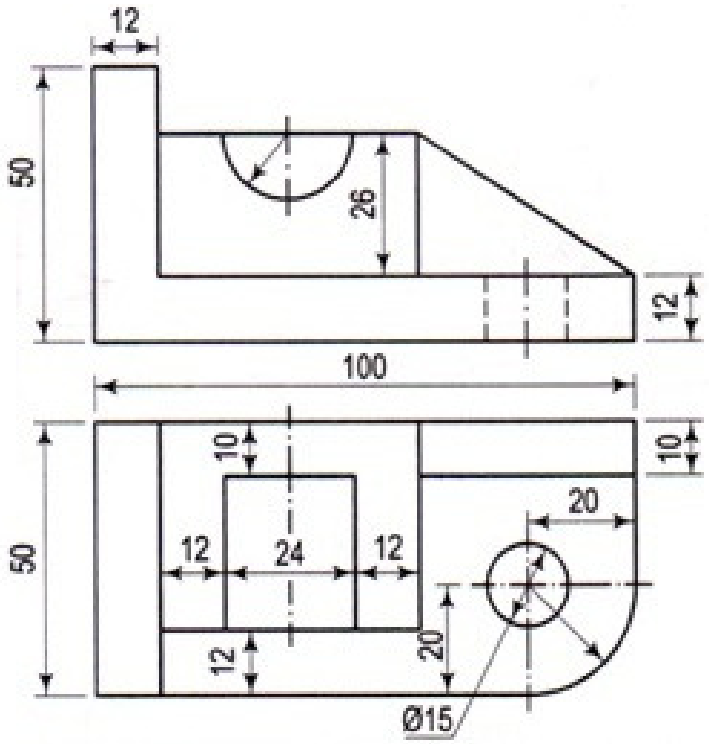
(Common to ECE, EIE, Bio-Tech, EComE, Agri.E)

Time: 3 hours **Max. Marks: 70**

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**
*****

PART-A

1.(a) Draw the isometric view of Fig.1



Note: All dimensions are in mm.
Fig.1

(b) A thin circular plate of 70 mm diameter is resting on its circumference such that its plane is inclined 60^0 to the H.P and 30^0 to the V.P. Draw the projections of the plate.

[12+10]

PART-B

2. (a) Construct a diagonal scale of R.F=1/4000 to show metres and long enough to measure upto 500 metres.

(b) Construct a regular hexagon of 35 mm side with one of its side vertical?

[10+6]

|''|'|''|''||'''||'|

3. (a) The front view of a line inclined at 30^0 to the V.P is 65 mm long. Draw the projections of the line, when it is parallel to and 40 mm above the H.P, its one end being 30 mm in front of the V.P.

   (b) Mark the projections of the following points on a common reference line, keeping the projectors 35mm apart.
   (i) A, 25mm above H.P and 35mm in front of V.P
   (ii) B, 25mm above H.P and 40 mm behind V.P
   (iii) C, 30mm below H.P and 45 mm behind V.P
   (iv) D, 30 mm below H.P and 40 mm in front V.P

[8+8]

4. A line AB, 90 mm long, is inclined at 45^0 to the H.P and its top view makes an angle of 60^0 with the V.P. The end A is in the H.P and 12 mm in front of the V.P. Draw its front view and find its true inclination with the V.P.

[16]

5. A square plate PQRS of negligible thickness having 35 mm side is lying on a corner R on H.P. One of the diagonals RP is inclined at 35^0 to H.P and 40^0 to V.P. The two sides QR and RS containing the corner R are equally inclined with H.P. Draw its projections.

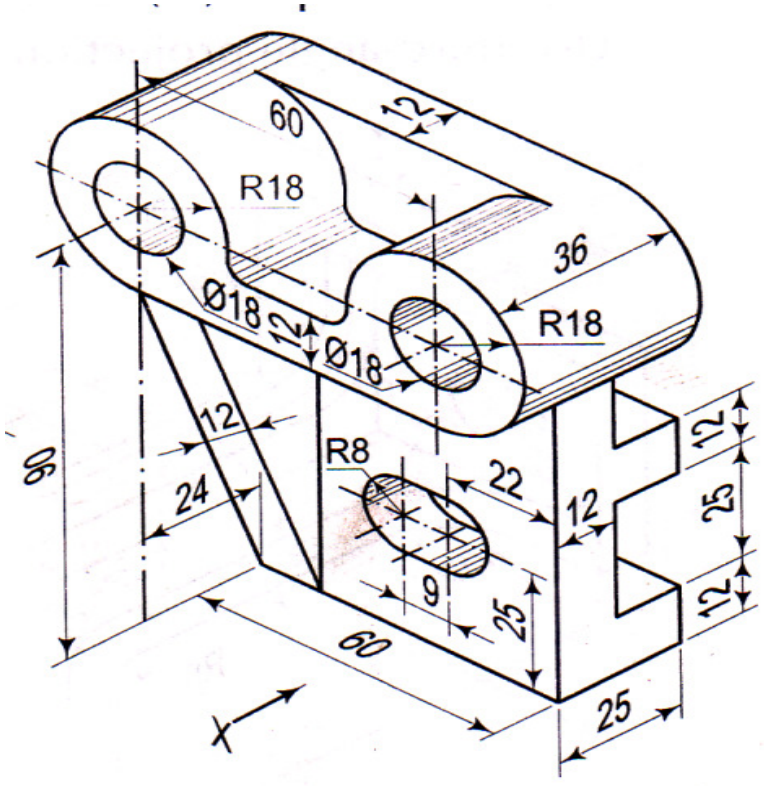
[16]

6. A hexagonal pyramid side of base 25 mm axis 50 mm long lies with one of its rectangular faces on the H.P and its axis is parallel to the V.P. Draw its projections.

[16]

7. Draw (i) Front view and (ii) Top view of Fig.2

[16]



Note: All dimensions are in mm.

Fig.2

|''|'|''|''||''||'|

Subject Code: R13109/R13 **Set No - 4**

I B. Tech I Semester Regular Examinations Feb./Mar. - 2014

ENGINEERING DRAWING

(Common to ECE, EIE, Bio-Tech, EComE, Agri.E)

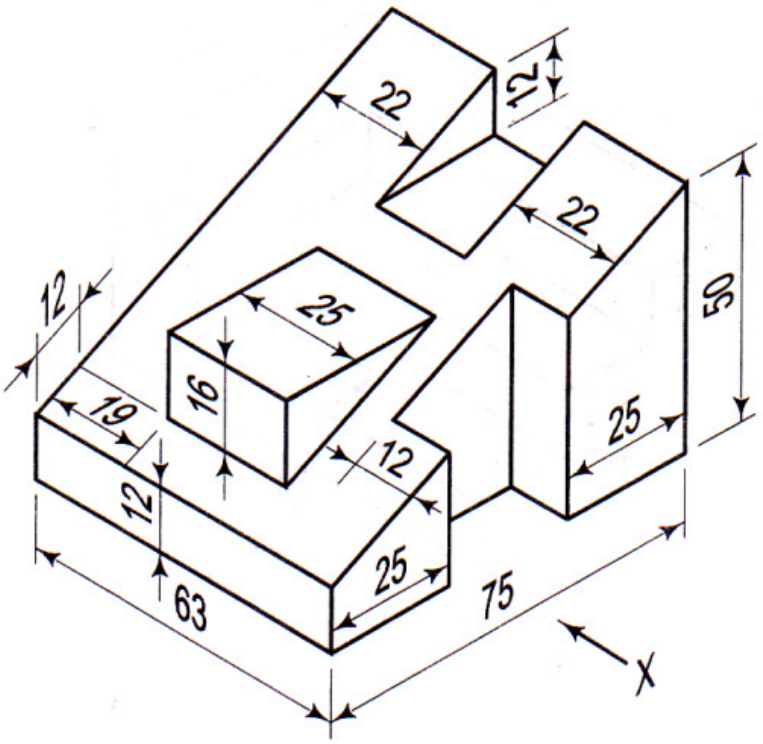
Time: 3 hours **Max. Marks: 70**

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**

*****

PART-A

1.(a) Draw (i) front view (ii) side view from the left (iii) top view of Fig.1



Note: All dimensions are in mm.

Fig.1

(b) A hexagonal prism base 40 mm side and height 40 mm has a hole of 40 mm diameter drilled centrally through its ends. Draw its projections when it is resting on one of its corners on the H.P with its axis inclined at 60^0 to the H.P and two of its faces parallel to the V.P.

[12+10]

PART-B

2. (a) Construct an ellipse when the major axis is 120 mm and the distance between the foci is 108 mm. Determine the length of the minor axis.

(b) Draw a vernier scale of R.F = 1/25 to read centimeters up to 4 metres and on it, show lengths representing 2.39 m and 0.91 m.

[8+8]

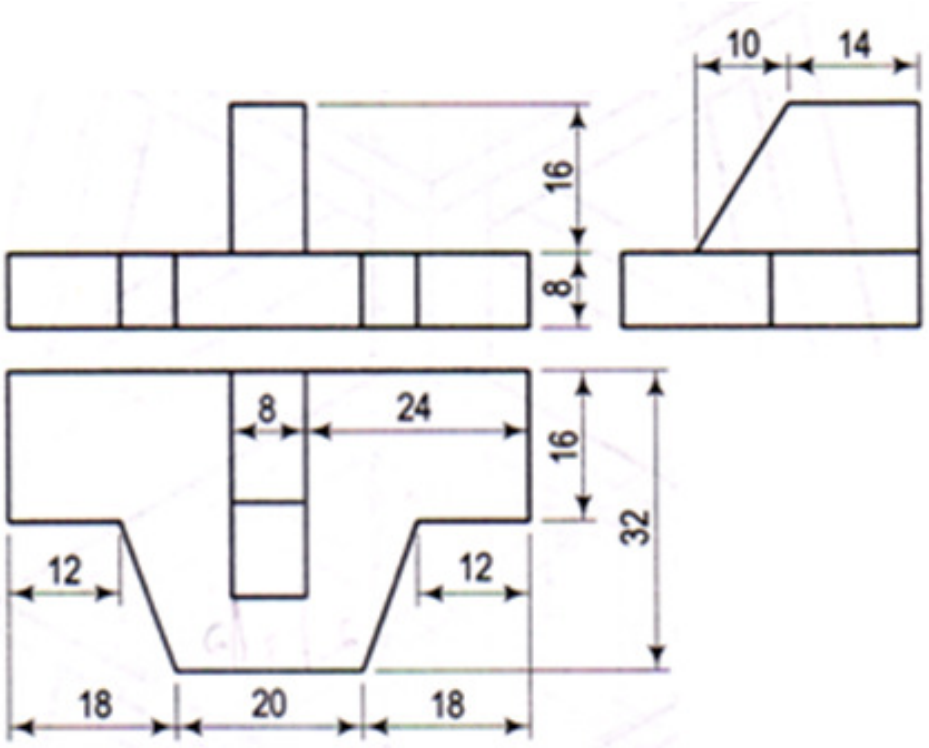
3. Two pegs fixed on a wall are 4.5 metres apart. The distance between the pegs measured parallel to the floor is 3.6 metres. If one peg is 1.5 m above the floor, find the height of the second peg and the inclination of the line joining the two pegs with the floor. [16]

4. A line CD inclined at 25^0 to H.P measures 80 mm in top view. End C in the first quadrant and 25 mm and 15 mm from H.P and V.P respectively. End D is at equal distances from both the reference planes. Draw the projections; find true length and true inclination with V.P. Locate the traces. [16]

5. A 60^0 set-square of 125 mm longest side is so kept that the longest side in the H.P making an angle of 30^0 with the V.P and the set-square itself inclined at 45^0 to the H.P. Draw the projections of the set- square. [16]

6. Draw the projections of a pentagonal pyramid of base 25 mm side and axis 60 mm long when it is lying on H.P on one of its base edges, such that the axis is parallel to VP and inclined at 30^0 to HP. [16]

7. Draw the isometric view of Fig.2: [16]



Note: All dimensions are in mm.
Fig. 2.

Code No: R10106/R10 **Set No. 1**

I B.Tech I Semester Supplementary Examinations, Feb/Mar 2014
ENVIRONMENTAL STUDIES
(Common to Mechanical Engineering, Electronics & Communication Engineering, Chemical Engineering, Information Technology, Electronics & Computer Engineering, Mining and Petroliem Technology)

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Critically discuss what are the important objectives and the guiding principles of environmental studies? [15]
2. Discuss the reasons for land degradation and suggest steps to control it and explain what is Soil management, Shifting cultivation, Desertification and Man induced landslides. [15]
3. (a) Define ecosystem? and types of ecosystems in the nature.
   (b) What are the general characteristics of an ecosystem? [8+7]
4. (a) Name a few birds and their contribution to the environment?
   (b) What are the ecological services rendered by forests? Cite the examples of aesthetic, recreational, economic, historical, cultural and religious values of forest around your place. [5+10]
5. (a) How does marine pollution occur?
   (b) What are the International activities to control marine pollution? [8+7]
6. (a) What are the powers provided to the central Government by the Environmental Protection Act, 1986?
   (b) Write short note on environmental victims and their rehabilitation? [8+7]
7. (a) what is the Maximum carrying capacity and Exponential growth of population? Explain?
   (b) what is your role for control of diseases in your local region? [8+7]
8. (a) Explain the types of components that are present in the solid waste material.
   (b) What are the types of observations you find when you visited the polluted and non polluted zone. [8+7]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R10106/R10 **Set No. 2**

I B.Tech I Semester Supplementary Examinations, Feb/Mar 2014
ENVIRONMENTAL STUDIES
(Common to Mechanical Engineering, Electronics & Communication Engineering, Chemical Engineering, Information Technology, Electronics & Computer Engineering, Mining and Petroliem Technology)

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Describe the guiding principles of environmental education? Give an account of formal and non-formal environmental education being imparted in India? [15]
2. (a) Is it necessary to construct multipurpose dams, if not suggest alternatives and discuss the impact of dams on forests and tribal people?
   (b) Discuss any two case studies of people's movement against construction of dams. [8+7]
3. (a) What roles do autotrophs and heterotrophs play in the ecosystem?
   (b) Explain the process of a succession in a newly formed pond ecosystem. [8+7]
4. (a) What are the major biogeographical regions in India.
   (b) Enumerate the biosphere reserves of India. [8+7]
5. (a) How to control thermal pollution in Industries?
   (b) Define noise pollution? How noise pollution can be controlled? [7+8]
6. (a) Discuss the salient features of Wild life (protection)Act,1972
   (b) Discuss the salient features of Forest (conservation) Act, 1980 [8+7]
7. (a) What do you mean by "Slum"? What kind of shelter does it provide?
   (b) What are the objectives of UDHR by the United Nations? [8+7]
8. (a) Explain the types of components which are present in the solid waste material.
   (b) What are the types of observations you find when you visited a polluted and non polluted zone. [8+7]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R10106/R10 **Set No. 3**

I B.Tech I Semester Supplementary Examinations, Feb/Mar 2014
ENVIRONMENTAL STUDIES
(Common to Mechanical Engineering, Electronics & Communication Engineering, Chemical Engineering, Information Technology, Electronics & Computer Engineering, Mining and Petroliem Technology)

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Write a detailed note on the various governmental institutions and organizations in the field of public awareness and preservation of natural assets? [15]
2. Explain the use of solar energy for the purpose of Solar water heating, Solar cooking, Solar electric power generation, Solar green houses and Solar drying of agriculture animal products. [15]
3. Write note on:
   (a) Nitrogen cycle
   (b) Carbon cycle
   (c) Hydrological cycle [5+5+5]
4. (a) Explain how the study of biodiversity is beneficial to human life.
   (b) Explain about consumptive value of biodiversity. [8+7]
5. (a) How does degradation of pesticides take place in soil?
   (b) What are the effects of using synthetic pesticides? [8+7]
6. (a) Do you think moral values prevent pollution in the environment? Explain your view?
   (b) Define climate change? Explain the sources and effects of Global warming? [8+7]
7. Write notes on the fallowing social security measures
   (a) Life insurance
   (b) Public Provident Fund
   (c) Categorical benefits
   (d) Employee's provident fund [5+5+5]
8. (a) What are the types forests in India? Define them and give proper examples.
   (b) What is the role of river water in preparing the EIA report for an Industry? [8+7]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R10106/R10 **Set No. 4**

I B.Tech I Semester Supplementary Examinations, Feb/Mar 2014
ENVIRONMENTAL STUDIES
(Common to Mechanical Engineering, Electronics & Communication Engineering, Chemical Engineering, Information Technology, Electronics & Computer Engineering, Mining and Petroliem Technology)

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Describe the various conservation practices followed in the society and by individuals for preservation of environmental assets?
   (b) Explain about "Urjagram and Model villages". [8+7]
2. (a) Explain selective felling and what are the negative impacts of timber extraction? Explain what measures need to be taken for conserving forest wealth?
   (b) "Forests act as factories of soils and often called as Earth lungs". Explain the statement. [8+7]
3. (a) What are decomposers? Explain their role in the ecosystem.
   (b) Discuss the major feature of a stream (river) that differs from that of a lake. [7+8]
4. (a) Explain about In-situ conservation of biodiversity.
   (b) What is the medicinal value of biodiversity? [8+7]
5. (a) How is liquid waste managed?
   (b) How municipal waste is handled in Indian cities and towns? [8+7]
6. (a) What are the objectives of Environmental Impact Assessment(EIA)?
   (b) write short notes on
   (i)Polluter pays principle(PPP)?
   (ii)Carbon Trading [8+7]
7. Write the following
   (a) occupational health hazards
   (b) water born diseases
   (c) Air born diseases [5+5+5]
8. (a) What are the types of farming carried out by tribal culture and explain the effects of such farming on mountains.
   (b) What are differences you observe between the Eco Tourism Park and normal amusement park. [8+7]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R10107/R10 **Set No. 1**

I B.Tech I Semester Supplementary Examinations, Feb/Mar 2014
MATHEMATICAL METHODS
(Common to Civil Engineering, Electrical & Electronics Engineering, Computer Science & Engineering, Electronics & Instrumentation Engineering, Aeronautical Engineering, Bio-Technology and Automobile Engineering)

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Find value of K if rank of A is 3, if $A = \begin{bmatrix} 1 & 2 & -1 & 3 \\ 4 & 1 & 2 & 1 \\ 3 & -1 & 1 & 2 \\ 1 & 2 & 0 & K \end{bmatrix}$
   (b) Solve by Gauss elimination method 10x+y+z=12; 2x+10y+z=13; x+y+5z=7; [7+8]

2. (a) Prove that the Eigen values of a triangular matrix are diagonal elements of the matrix
   (b) Find eigen vectors of B=2A^2– A + 3I when $A = \begin{bmatrix} 8 & -4 \\ 2 & 2 \end{bmatrix}$ [5+10]

3. Define the nature of the quadratic form. Identify the nature of the quadratic form $x_1^2 + 4x_2^2 + x_3^2 - 4x_1x_2 + 2x_1x_3 - 4x_2x_3$ [15]

4. (a) Evaluate the real root of the equation $x^2 - 9x + 1 = 0$ by Bisection method
   (b) Compute the real root of the equation $x^3 - x^2 - 1 = 0$by the method of false position. [8+7]

5. (a) Compute the approximate value of e^{-x} when x= 1.7489 from the following table using the Gauss forward interpolation formula.

x	1.72	1.73	1.74	1.75	1.76	1.77	1.78
e^{-x}	0.179066	0.177284	0.175520	0.173774	0.172045	0.170333	0.168638

   (b) Find the Parabola passing through the points (0, 1), (1,3) and (3,5), Using Lagrange's Interpolation formula. [8+7]

6. (a) Find the first and second derivatives of the function tabulated below at the point x = 1.5.

X	1.5	2.0	2.5	3.0	3.5	4.0
Y	3.375	7.0	13.625	24.0	38.875	59.0

   (b) Evaluate $\int_{0.6}^{2.0} y\,dx$ using Trapizoidal, Simpsons 1/3 and Simpsons 3/8 rules.

X	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
y	1.23	1.58	2.03	4.32	6.25	8.38	10.23	12.45

[8+7]

7. (a) Solve $y^1=3x+y/2$, $y(0)=1$ by Taylor series method and hence find $y(0.1)$, $y(0.2)$

   (b) Solve the equation $\frac{dy}{dx} = xy + 1$, $y(0)=1$ by Picard's method and hence find $y(0.1)$ [8+7]

8. (a) Fit a least square parabola $y= a+bx+cx^2$ to the following data

x	-3	-2	-1	0	1	2	3
y	4.63	2.11	0.67	0.09	0.63	2.15	4.58

   (b) Fit a straight line of the form $y= a+bx$ to the following data

x	1	2	4	5	6	8	9
y	2	5	7	10	12	15	19

[7+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R10107/R10 **Set No. 2**

I B.Tech I Semester Supplementary Examinations, Feb/Mar 2014
MATHEMATICAL METHODS
(Common to Civil Engineering, Electrical & Electronics Engineering, Computer Science & Engineering, Electronics & Instrumentation Engineering, Aeronautical Engineering, Bio-Technology and Automobile Engineering)

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Find rank of $A = \begin{bmatrix} 2 & 1 & 3 & 1 \\ 0 & 1 & 2 & -2 \\ 4 & 0 & 2 & 6 \end{bmatrix}$ using Normal Form
   (b) Solve by Gauss seidal method x+4y+15z=24, x+12y+z=26, 10x+y-2z=10 [7+8]

2. (a) Find Eigen Vectors of $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$
   (b) If λ is an Eigen value of A then prove that $\frac{|A|}{\lambda}$is an Eigen value of Adj. A [7+8]

3. Find the rank, signature and index of the quadratic form $2x_1^2 + x_2^2 - 3x_3^2 + 12x_1x_2 - 4x_1x_3 - 8x_2x_3$by reducing it to normal form .Also write the linear transformation which brings about the normal reduction [15]

4. (a) Using Newton- Raphson's method compute $\sqrt{41}$ correct to four decimal places.
   (b) Find a real root of the equation $e^x = x+2$in the interval [1, 1.4] using bisection method. [8+7]

5. (a) Apply Gauss backward interpolation formula to find y when x = 26 form the following table:

x	20	24	28	32
Y	2854	3162	3544	3992

   (b) Using Lagrange's interpolation formula, find the value of y when x = 2 from the following data:

x	1	3	4	6
y	4	40	85	259

[8+7]

6. (a) Find the value of $f'(x)$ at x=0.01 from the following table using Bessel's formula.

x	0.01	0.02	0.03	0.04	0.05	0.06
f(x)	0.1023	0.1047	0.1071	0.1096	0.1122	0.1148

   (b) Find the area bounded by the curve y = $e^{-\frac{x^2}{2}}$, x - axis between x = 0 and x = 3 by using Simpson's 3/8 rule. [8+7]

7. (a) Solve y^1=x-y, y(0)=1 by modified Euler's method and find y(0.1), y(0.2)
   (b) Apply third order R-K method to find y(0.25) where y^1=1+xy, y(0)=1 [8+7]

8. (a) Fit a power curve $y=ax^b$ to the following data

x	5	6	7	8	9	10
y	133	55	23	7	2	2

   (b) Fit a curve of the type $y= a+bx+cx^2$ to the following data

x	0	1	2	3	4	5	6
y	14	18	23	29	36	40	46

[7+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R10107/R10 **Set No. 3**

I B.Tech I Semester Supplementary Examinations, Feb/Mar 2014
MATHEMATICAL METHODS
(Common to Civil Engineering, Electrical & Electronics Engineering, Computer Science & Engineering, Electronics & Instrumentation Engineering, Aeronautical Engineering, Bio-Technology and Automobile Engineering)

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Find rank using Normal Form $A = \begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$

   (b) Solve Homogeneous equations $x_1+2x_2+3x_3=0$, $2x_1+3x_2+x_3=0$, $4x_1+5x_2+4x_3=0$, $X_1+x_2-2x_3=0$ [7+8]

2. (a)Find Eigen values and Eigen vectors of $\begin{bmatrix} 8 & 4 \\ 2 & 2 \end{bmatrix}$

   (b) If λ is an Eigen value of A then prove that λ^{-1} is an Eigen value of A^{-1} if it exists [7+8]

3. Find the rank, signature and index of the quadratic form $2x_1^2 + x_2^2 - 3x_3^2 + 12x_1x_2 - 4x_1x_3 - 8x_2x_3$by reducing it to normal form .Also write the linear transformation which brings about the normal reduction [15]

4. (a) Find out square root of 25 given x_0=2, $x_{1=}$7 using Bisection method

   (b) Solve the equation $x^3 + 2x^2 + 10x = 20$by iteration method [8+7]

5. (a) Use gauss forward interpolation formula to estimate f(32), given f(25) = 0.2707, f(30) = 0.3027, f(35) = 0.3386, f(40) = 0.3794.

   (b) Find the interpolating polynomial f(x) from the table given below.

x	0	1	4	5
f(x)	4	3	24	39

   [8+7]

6. (a) Using the table below, find $f'(0)$

x	0	2	3	4	7	9
f(x)	4	26	58	110	460	920

   (b) Evaluate $\int_0^1 \sqrt{1+x^3}$ dx taking h = 0.1 using Simpson's $3/8^{th}$ rule. [8+7]

7. (a) Solve y^1=x+y subject to the condition y(0)=1 by Taylor series method and hence find y(0.2), y(0.4)

   (b) Solve y^1=x-y, y(0)=1 by Picard's method and hence find y at x=0.2 [8+7]

8. (a) Fit a curve of the type y= a+bx+cx^2 to the following data

x	10	15	20	25	30	35
y	35.3	32.4	29.2	26.1	23.2	20.5

(b) Fit a curve of the type y=ab^x to the following data by the method of least squares

x	1	2	5	10	20	30	40	50
Y	98.2	91.7	81.3	64	36.4	32.6	7.1	11.3

[7+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R10107/R10 **Set No. 4**

I B.Tech I Semester Supplementary Examinations, Feb/Mar 2014
MATHEMATICAL METHODS
(Common to Civil Engineering, Electrical & Electronics Engineering, Computer Science & Engineering, Electronics & Instrumentation Engineering, Aeronautical Engineering, Bio-Technology and Automobile Engineering)

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Find rank of matrix using Normal form $A = \begin{bmatrix} 1 & 2 & 3 & -2 \\ 2 & -2 & 1 & 3 \\ 3 & 0 & 4 & 1 \end{bmatrix}$

   (b) Solve system of equations, if consistent 2x-y-z=2 , x+2y+z=2, 4x-7y-5z=2 [7+8]

2. Verify Cayley - Hamilton theorem and find A^{-1} if $A = \begin{bmatrix} 2 & -1 & 2 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ [15]

3. Reduce the quadratic form to canonical from by an orthogonal reduction and state the nature of the quadratic form $5x^2 + 26y^2 + 6xy + 4yz + 14zx$. Also find its rank signature and index. [15]

4. (a) Using Newton-Raphson's method find the square root of a number and hence find the square root of 24.

   (b) Find a real root of the equation $x=e^{-x}$, using Bisection method [8+7]

5. (a) Apply Gauss's forward formula to find f(x) at x = 3.5 from the table below.

X	2	3	4	5
F(x)	2.626	3.454	4.784	6.986

   (b) Find sin 45^0 using Gauss's backward interpolation formula given that sin 20^0 = 0.342, sin 30^0 = 0.502, sin 40^0 =0.642, sin 50^0 = 0.766, sin 60^0 =0.866, sin 70^0 = 0.939, sin 80^0 = 0.984. [8+7]

6. (a) Given the following table. Find $f'(1)$ and $f''(3)$

x	0	2	4	6	8
f(x)	7	13	43	145	367

   (b) Find approximate value of $\int_1^{1.04} f(x)dx$using the following table.

x	1	1.01	1.02	1.03	1.04
f(x)	3.953	4.066	4.182	4.300	4.421

   [8+7]

7. (a) Given that $\frac{dy}{dx} = \frac{(1+x^2)y^2}{2}$, y(0)=1, y(0.1)=1.06, y(0.2)=1.12, y(0.3)=1.21 then evaluate y(0.4) by Milne's predictor corrector method

(b) Solve $\frac{dy}{dx} = \frac{y-x}{y+x}$, y(0)= 1 estimate y(0.1) and y(0.2) using Euler's method in 5 steps [8+7]

8. (a) Fit a least square parabola y= a+bx+cx^2 to the following data

x	1	2	3	4	5
y	5	12	25	44	69

(b) Fit a straight line of the form y= a+bx to the following data

x	1	2	3	4	5
y	5	12	26	60	90

[8+7]

⋆ ⋆ ⋆ ⋆ ⋆