Sr. No.................... Roll No.................

B.SC. (HONS.) MATHEMATICS- 6th SEMESTER EXAMINATIONS: MAY-2018

SUBJECT: Real and Complex Analysis; PAPER CODE- 09050601

Time: 03:00 Hrs. Max. Marks: 75

Instructions:

1. Write your Roll No. on question paper.
2. Candidates should ensure that they have been provided with the correct question paper. Complaints in this regards, if any should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter.
3. Attempt FIVE questions in ALL, Q.1 is compulsory. Students are required to attempt FOUR questions selecting one question from each unit. Marks are indicated against each question.
4. Draw Diagram wherever required.

1a. Evaluate: $\int_0^{\pi/2} \sin^5 x dx$. [3]

1b. If $x = rcos\theta, y = r\sin\theta$, show that $\frac{\partial(x,y)}{\partial(r,\theta)} \cdot \frac{\partial(r,\theta)}{\partial(x,y)} = 1$ [3]

1c. Find half range cosine series for $f(x) = x$, $0 < x < 2$. [3]

1d. Using the definition of derivative, find the derivative of $w = f(z) = z^2 - 2z$ at $z = -1$. [3]

1e. Find the fixed points and normal forms of the transformation $w = \frac{z-1}{z+1}$. [3]

Unit 1

2a. Show that value of the integral $\int\int\int x^\alpha y^\beta z^\gamma (1-x-y-z)^\lambda dxdydz$ over the tetrahedron formed by the co-ordinate planes and plane $x+y+z=1$ is $\frac{\Gamma(\alpha+1)\Gamma(\beta+1)\Gamma(\beta+1)\Gamma(\gamma+1)}{\alpha+\beta+\gamma+\lambda+4}$. [8]

2b. Show that the functions $u = x+2y+z, v = x-2y+3z, w = 2xy-xz+4yz-2z^2$ are dependent. Also find the relationship between them. [7]

3a. Evaluate the integral $\int_0^a \int_{\frac{y^2}{a}}^{y} \left(\frac{y}{(a-x)\sqrt{(ax-y^2)}}\right) dxdy$ by changing the order of integration. [8]

3b. Show that $B(m,n) = \frac{(m-1)!(n-1)!}{(m+n-1)!}$, if m, n are positive integers. [7]

Unit 2

4a. Obtain a Fourier series for $f(x) = \sqrt{1 - \cos x}$ in the interval $(0,2\pi)$ and hence find the value of $\frac{1}{1\cdot 3} + \frac{1}{3\cdot 5} + \frac{1}{5\cdot 7} + \cdots$. [8]

4b. Given the series $x = 2\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n} \sin nx$, show that $\sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$. [7]

5a. Find the Fourier series expansion of the function $f(x)$ in $(0,2\,\pi)$, where

$$f(x) = \begin{cases} x & \text{for} \quad 0 < x < \pi \\ 0 & \text{for} \quad \pi < x < 2\pi \end{cases}$$

Also find the sum of the series at $x = \pi$. [8]

5b. Find the half range cosine series for $f(x) = x(\pi - x)$ in the interval $(0,\pi)$. Hence deduce that $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \cdots$ [7]

Unit 3

6a. If a function $f(z) = u(x,y) + iv(x.y)$ is differentiable at the point $z_0 = x_0 + iy_0$ in a domain D, then the four partial derivatives u_x, u_y, v_x and v_y exist at (x_0, y_0) and satisfy the equations

$$u_x = v_y \textit{ and } u_y = -v_y$$

[10]

6b. Construct a function $f(z)$ which has a real function

$$u(x,y) = e^x(x\cos y - y\sin y)$$

[5]

7a. Show that the function

$$f(z) = \begin{cases} \frac{(\bar{z})^2}{z}, & z \neq 0 \\ 0, & z = 0 \end{cases}$$

is not differentiable at origin, although the C-R equations are satisfied at that point. [8]

7b. If $u + v = \frac{\sin 2x}{\cosh 2y - \cos 2x}$ and $f(z) = u + iv$ is an analytic function of z, then find $f(z)$ in terms of z. [7]

Unit 4

8a. If $f(z) = u + iv$ is analytic in domain D, then show that the curves u=constant and v=constant, form two orthogonal families. [7]

8b. Find the invariant points of the transformation $w = -\left(\frac{2z+4i}{iz+1}\right)$. Also, prove that these two points together with any point z and its image w, form a set of four points having a constant cross ratio. [8]

9a. Show that unit circle in w-plane correspond to a parabola in z -plane and inside of the circle correspond to the outside of parabola under the transformation $(w+1)^2 = \frac{4}{z}$. [7]

9b. Show that cross ratio remains invariant under Mobius transformation. [8]

Roll No. ______________

B. Sc (Hons) Mathematics - 6^{th} Semester
Linear Algebra - 09050602
END TERM THEORY EXAMINATION

Time: 03:00 Hrs **Max. Marks: 75**

Instructions:

1. Write Roll No. on the Question Paper.
2. Candidate should ensure that they have been provided with correct question paper. Complaint(s) in this regard, if any, should be made within 15 minutes of the commencement of the exam. No complaint in this regard will be entertained thereafter.
3. Attempt 5 Questions in all. **Q. No. 1** is compulsory. Students are required to attempt other **FOUR** questions selecting one from each unit. Marks are indicated against each question.
4. Draw diagram wherever required.

Q.1. Answer the following Questions. **(5×3=15)**

a) Define basis of a vector space and the inner product space.

b) State Rank-Nullity theorem.

c) Find the norm of the vector u=(2, -3 ,6) and normalize this vector.

d) Find the dimension of the vector space $Q(\sqrt{2})$ over Q.

e) Define singular and non-singular transformation.

UNIT-I

Q.2. a) Prove that the union of two subspaces is a subspace if and only if one is contained in the other. **(8)**

b) Determine a basis of the subspace spanned by the vectors (3,2,4), (1,0,2), (1,-1,-1) and (6,7,5). **(7)**

OR

Q.3. a) Let W be a subspace of a finite dimensional vector space V(F), then $\dim \frac{V}{W} = \dim V - \dim W$. **(8)**

b) Prove the necessary and sufficient conditions for a vector space V(F) to be a direct sum of its subspaces W_1 and W_2 are that :

(i) $V = W_1 + W_2$ **(ii)** $W_1 \cap W_2 = \{0\}$ **(7)**

UNIT-II

Q.4. a) Let T:U→V be a linear transformation then show that $\frac{U}{KerT} \cong T(U)$ **(8)**

b) Let the transformation T: $R^3 \to R^3$ such that T(X)=AX, where $A = \begin{bmatrix} 1 & 3 & 2 \\ 2 & 1 & 1 \\ 3 & 2 & 3 \end{bmatrix}$ Find

(i) the image of X =(1,1,2) **(ii)** the vector X whose image is (-2,-5,-5) **(7)**

OR

P.T.O.

Q.5. a) Let V be the vector space of 2×2 matrices over R ant let $M = \begin{bmatrix} 1 & -1 \\ -2 & 2 \end{bmatrix}$, Let $T:V\to V$ be the linear map defined by $T(A)= MA$ for all $A \varepsilon V$. Find the basis and dimension of **(i)** range of T **(ii)** null space T **(8)**

b) Show that the linear transformation $T:R^2\to R^2$ defined by

$T(x_1,x_2)=(x_1\cos\theta + x_2\sin\theta, -x_1\sin\theta + x_2\cos\theta)$ is a vector space isomorphism (i.e bijective). **(7)**

UNIT-III

Q.6. a) Find the matrix representing the transformation $T:R^2\to R^3$ given by $T(x_1,x_2)= (3x_1 - x_2, 2x_1 + 4x_2, 5x_1 - 6x_2)$ relative to the standard basis of R^2 and R^3. **(8)**

b) If $B = \{(1,-2,3), (1,-1,1), (2,-4,7)\}$ is a basis of R^3, then find the dual basis of B. **(7)**

OR

Q.7. a) Find the eigen values and eigen vectors of the matrix $\begin{bmatrix} 3 & 1 & 1 \\ 2 & 4 & 2 \\ 1 & 1 & 3 \end{bmatrix}$ **(8)**

b) If $T_1:U\to V$ and $T_2:V\to W$ are two invertible linear transformations, then show that T_2T_1 is also invertible and $(T_2T_1)^{-1}=T_1^{-1}T_2^{-1}$. **(7)**

UNIT-IV

Q.8. a) If V be an inner product space, then show that $|<u,v>| \le \|u\|\|v\|$ for all $u,v \,\varepsilon\, V$. **(8)**

b) Show that every inner product space is a metric space. **(7)**

OR

Q.9. a) Show that every finite dimensional vector space is an inner product space. **(8)**

b) Let T be a linear operator on an inner product space V(F). Then show that T^* exists and $TT^*=T^*T= I$ iff T is unitary. **(7)**

Roll No. ________________

B. Sc (Hons) Mathematics 6th Semester
Dynamics - 9050603
END TERM THEORY EXAMINATION

Time: 03:00 Hrs **Max. Marks: 75**

Instructions:

1. Write Roll No. on the Question Paper.
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3. Attempt 5 Questions in all. **Q. No. 1** is compulsory. Students are required to attempt other **FOUR** questions selecting one from each unit. Marks are indicated against each question.
4. Draw diagram wherever required.

Q.1. Answer the following Questions. **(3×5=15)**

a) A particle describes an equiangular spiral $r = ae^{m\theta}$ with constant angular velocity. Find its velocity and acceleration.

b) A constant force act on a body of mass 20 gm and produces a velocity of 27 cm/sec in 6 seconds. If the body was initially at rest, find the force.

c) A particle is projected with a velocity 49 m/sec in a direction making an angle 45^o with the horizontal. Find the time of flight.

d) Write the Kepler's laws of planetary motion.

e) Define the following:

(i) Simple harmonic motion (S.H.M)

(ii) Central orbit

UNIT-I

Q.2. (a) Find the expressions for the tangential and normal components of velocity of a particle moving along a plane curve. **(7)**

(b) Obtain the expression for velocity and position of a particle executing S.H.M. **(8)**

OR

Q.3. (a) Two motor cars are moving uniformly along two straight roads, making an angle 60^o with each other, with velocities of 20km/hour and 12 km/hour. If the first car be moving towards and the second away from the junction of the road, find the relative velocity of the first car with respect to the second. **(8)**

(b) The greatest and least velocities of a certain planet in its orbit, round the sun are 30 km/sec and 29.2 km/sec respectively. Find the eccentricity of the orbit. **(7)**

UNIT-II

Q.4. (a) Show that the particle executing S.H.M requires $(1/6)^{th}$ of its period to move from position of maximum displacement to one in which the displacement is half of the amplitude. **(7)**

(b) A force of 150 Newtons acts on a body of mass 15 kg for 5 minutes and then ceases. What is force required to bring the body to rest in 2 minutes. **(8)**

OR

Q.5. (a) Two masses m1 and m2 (m1>m2) are suspended by a light inextensible and flexible string which passes over a smooth fixed and light pulley. Find the motion of the system, the tension in the string and the pressure on the pulley. **(7)**

(b) A particle of mass m falls from rest at a height h above the ground. Show that the sum of kinetic and potential energies is constant throughout the motion. **(8)**

UNIT-III

Q.6. (a) A particle slides down the outside of a smooth vertical circle starting from rest. Find out the expression for velocity and reaction at any point during its motion. **(8)**

(b) Two balls are projected from the same point in directions inclined at $60''$ and $30''$ to the horizontal. What is the ratio of their velocities

i) If they attain same height.

ii) If they have same horizontal range. **(7)**

OR

Q.7. (a) A particle of mass m is projected in a vertical plane through the point of projection with velocity u in a direction making an angle α with the horizontal. Find its motion and path described. **(8)**

(b) A heavy particle slides down a smooth cycloid starting from rest at the cusp, the axis being vertical and vertex downwards. Prove that magnitude of the acceleration is equal to g. **(7)**

UNIT-IV

Q.8. (a) Derive the differential equation of central orbit in polar from. **(8)**

(b) A particle describes the equiangular spiral $r = ae^{\theta\cot\alpha}$ under a force to the pole. Find the law of force. **(7)**

OR

Q.9. (a) From Kepler's laws of motion deduce Newton's law of gravitation. **(8)**

(b) An elastic string whose modulus of elasticity is λ is stretched to double its length and is tied to two fixed points distance 2a apart. A particle of mass m, tied to its middle point is displaced along the line of string through a distance equal to half its distance from the fixed point and released. Prove that the time of complete oscillation is $\Pi\sqrt{\frac{am}{\lambda}}$ and maximum velocity acquired is $\sqrt{\frac{am}{\lambda}}$. **(7)**

Roll No. ____________

B. SC. (HONS) MATHEMATICS – 6th Semester
(ELEMENTARY TOPOLOGY - 09050604)
END TERM THEORY EXAMINATION

Time: 03:00 Hrs **Max. Marks: 75**

Instructions:

1. Write Roll No. on the Question Paper.
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3. Attempt **5** Questions in all. **Q. No. 1** is compulsory. Students are required to attempt other **FOUR** questions selecting one from each unit. Marks are indicated against each question.
4. Draw diagram wherever required.

Q.1. Answer the following Questions. **(3*5=15)**

a) Define a topological space. List all the topologies on $X=(a,b,c)$ which contain exactly 5 elements.

b) If U is open in Y and Y is open in X, then show that U is open in X.

c) Show that the lower limit topology is strictly finer than the Standard topology.

d) Define Limit point of a subset and Neighborhood of a point with an example.

e) Define Hausedorff with example.

UNIT-I

Q.2. **(5*3=15)**

a) Define a co-countable topology. Show that the collection $T_c=\{U:X-U$ is countable or is all of $X\}$ is a topology.

b) Define Hausdorff space. Show that the topological space (X,T) is Hausdorff if and only if the diagonal $\Delta=\{x\times x:x\in X\}$ is closed in $X\times X$.

c) Show that the arbitrary intersection of Topologies is again a Topology.

OR

Q.3. **(5*3=15)**

a) Prove that $\overline{A}=A\bigcup D(A)$, where $\overline{A}$ denotes the closure of A in X and $D(A)$ denote Derived set.

b) Show that a subset of a topological space is closed if and only if it contains all its limit points.

c) Define Interior of a set. If A and B are two sets then show that $A^o\bigcap B^o=(A\bigcap B)^o$.

UNIT-II

Q.4. If (X,T) and (Y,V) be two topological spaces then show the following

a) A mapping $f:X\to Y$ is continuous if and only if inverse image of every closed set in Y is closed in X. **(8)**

b) A mapping $f:X\to Y$ is continuous if and only if $[f^{-1}(B)]^o\supset f^{-1}(B^o)$ for every $B\subset Y$. **(7)**

OR

Q.5.

a) Define a connected topological space. Show that the union of a collection of connected subspaces of X, that have a point in common, is connected. **(8)**

b) Define a component of a topological space. Show that the components of a totally disconnected space are only the singleton subsets of X. **(7)**

UNIT-III

Q.6.

a) Define a compact space. Show that every closed subspace of a compact space is compact. **(8)**

b) Show that every compact subset of a Hausdorff space is closed. **(7)**

OR

Q.7.

a) Define Finite Intersection Property. Let (X,T) be a topological space then (X,T) is compact if and only if for every collection C of closed sets in X, having FIP, the intersection $\bigcap_{c\in C} C$ is non empty. **(8)**

b) Define sequentially compact space. Show that continuous image of a sequentially compact space is sequentially compact. **(7)**

UNIT-IV

(5*3=15)

Q.8.

a) Define Lindlof space. Show that the continuous image of a Lindlof space is Lindlof.

b) The property of being regular space is hereditary.

c) A topological space (X,T) is T_1 if and only if every singleton subset of X is closed.

OR **(5*3=15)**

Q.9.

a) Every compact Hausdorff space is regular.

b) Every compact Hausdorff space is normal.

c) Let (X,T) be a topological space and one point set in X are closed. Then (X,T) is regular if and only if for a given point x of X and an open set U of x there exists an open set V of x such that $\overline{V} \subset U$.

**************ETE MAY JUNE 2018***************

Roll No. ____________

B.Sc.(Hons.) – MATHEMATICS – 6th SEMESTER

Fluid Dynamics -9050605

END TERM THEORY EXAMINATION

Time: 03:00 Hrs **Max. Marks: 75**

Instructions:

1. Write Roll No. on the Question Paper.
2. Candidate should ensure that they have been provided with correct question paper. Complaint(s) in this regard, if any, should be made within 15 minutes of the commencement of the exam. No complaint in this regard will be entertained thereafter.
3. Attempt 5 Questions in all. **Q. No. 1** is compulsory. Students are required to attempt other **FOUR** questions selecting one from each unit. Marks are indicated against each question.
4. Draw diagram wherever required.

Q.1. Attempt all questions:- **(6×2.5=15)**

a) Find complex potential for a line source.

b) Define Acyclic and cyclic irrotational motion.

c) Define Eulerian and Lagrangian descriptions of fluid motion.

d) Define path lines, stream lines and vortex lines.

e) Define Stokes stream function.

f) What are the Lagrange's equations of motion?

UNIT-I

Q.2. a) Find the equation of continuity in Cartesian co-ordinates for the flow of a incompressible fluid. **(7)**

b) If the velocity of an incompressible fluid at the point (x, y, z) is given by $\frac{3xz}{r^5}, \frac{3yz}{r^5}, \frac{3z^2 - r^2}{r^5}$. Prove that the liquid motion is possible and the velocity potential is $\frac{\cos\theta}{r^2}$. **(8)**

Q.3. a) The velocity field at a point in *fluid is given as* $\vec{q} = (\frac{x}{t}, y, 0)$. *Obtain path lines.* **(7)**

b) *Find the condition that the surface* $F(\vec{r}, t) = F(x, y, z, t) = 0$ may represent a boundary surface. **(8)**

UNIT-II

Q.4. a) Define the acceleration at a point of a fluid. Write the components of acceleration in cylindrical coordinates. **(8)**

b) If velocity distribution is $\vec{q} = i(Ax^2yt) + j(By^2zt) + k(Czt^2)$, where A, B, and C are constants, then find acceleration and vorticity components. **(7)**

P.T.O.

Q.5. a) Derive Euler equation of motion (for inviscid fluid) in vector form. (7)

b) Derive Bernoulli's equation for steady motion. (8)

UNIT-III

Q.6. a) State and prove Kelvin's Minimum energy Theorem. (7)

b) Define Doublet. Find velocity potential of doublet. (8)

Q.7. a) Discuss the motion of a sphere in an infinite mass of liquid with velocity u in X-direction, the liquid being at rest at infinity. (8)

b) Find the Stoke's stream function for a simple source at origin. (7)

UNIT-IV

Q.8. a) Find the equation of motion of a circular cylinder. (8)

b) Find the image of a two dimensional source in a plane. (7)

Q.9. a) State and prove Blasius theorem. (8)

b) Find the motion of two co-axial cylinders of radii a and b (a<b). (7)

Roll No................

B.SC. (HONS.) MATHEMATICS- 6TH SEMESTER
OPERATIONS RESEARCH-II; - 09050606
END TERM THEORY EXAMINATION

Time: 03:00 Hrs. **Max. Marks:** 75

Instructions:

1. Write your Roll No. on question paper
2. Candidates should ensure that they have been provided with correct question paper. Complaint(s) in this regard, if any should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter.
3. Attempt **FIVE** questions in **ALL**, selecting one question from each section. Question number **9** is compulsory. Marks are indicated against each question.
4. Draw diagram wherever required.

SECTION-I

Q.1 (a) What do you mean by inventory? Explain the various costs related to an inventory. **[7]**

(b) The annual demand of a particular item by a company is 10000 units. This item may be obtained from either an outside supplier or subsidiary company. The relevant data for the procurement of the item are given below:

Costs	**From outside supplier (Rs.)**	**From subsidiary company (Rs.)**
Cost per unit	12	13
Cost of placing an order	10	10
Cost of receiving an order	20	15
Storage and all carrying costs, including capital cost per unit per annum	2	2

What purchase quantity and from which source would you recommend to purchase? **[8]**

OR

2 (a) Explain the EOQ model with uniform demand with no shortages and derive the expression for the EOQ and optimum total inventory cost. **[10]**

(b) Find the optimum order quantity for a product for which the price breaks are as follows:

Quantity	Purchasing Cost
$0 < Q_1 < 100$	Rs. 20 per unit
$100 < Q_2 < 200$	Rs. 18 per unit
$200 \leq Q_3$	Rs. 16 per unit

The monthly demand for the product is 400 units. The storage cost is 20% of the unit cost of the product and the cost of ordering is Rs. 25 per month. **[5]**

SECTION-II

3 **(a)** Show that for a single server station with Poisson arrival and exponential service time the probability that exactly n calling units are in the queue is

$$P_n = (1-\rho)\rho^n, \quad n > 0$$

where ρ is the traffic intensity. Also find the expected number of units in the system. **[10]**

(b) In the production shop of a company the breakdown of the machines is found to be Poisson with an average rate 3 machines per hour. Breakdown time at one machine costs Rs. 40 per hour to the company. There are two choices before the company for hiring the repairmen. One of the repairman is slow but cheap, the other fast but expensive. The slow-cheap repairman demands Rs. 20 per hour and will repair the broken down machines exponentially at the rate of 4 per hour. The fast expensive repairmen demands Rs. 30 per hour and will repair machines exponentially at an average rate of 6 per hour. Which repairman should be hired? **[5]**

OR

4 **(a)** What is the multi-channel queuing system? Deduce the difference-differential equations when there are K channels. Show that, for the steady-state case the solution of the equations can be put in the form

$$P_n = \begin{cases} [P_0(\lambda/\mu)^n]/n!, & n < K \\ [P_0(\lambda/\mu)^n]/K!K^{n-K}, & n \geq K \end{cases}$$

where $$P_0 = \left[\sum_{n=0}^{K-1} \frac{1}{n!}\left(\frac{\lambda}{\mu}\right)^n + \frac{1}{K!}\left(\frac{\lambda}{\mu}\right)^K \left(1 - \frac{\lambda}{K\mu}\right)^{-1} \right]^{-1}.$$ **[7]**

(b) A super market has two girls running up sales at the counters. If the service time for each customer is exponential with mean 4 minutes, and if people arrive in a Poisson fashion at the rate of 10 an hour.

(i) What is the probability of having to wait for service?

(ii) What is the expected percentage of idle time for each girl?

(iii) If the customer has to wait, what is the expected length of his waiting time? **[8]**

SECTION-III

5. (a) What is sequencing problem. Explain the principal assumptions made while dealing with sequencing problem. **[5]**

(b) Determine the optimal sequence of jobs that minimizes the total elapsed time based on the following information processing time on machines is given in hours and passing is not allowed:

Job	*A*	*B*	*C*	*D*	*E*	*F*	*G*
Machine M_1	3	8	7	4	9	8	7
Machine M_2	4	3	2	5	1	4	3
Machine M_3	6	7	5	11	5	6	12

[10]

OR

6. What is replacement problem? A manufacturer is offered two machines P and Q. P is priced at Rs. 5000, and running costs are estimated at Rs. 800 for each of the first five years, increasing by Rs. 200 per year in the sixth and subsequent years. Machine Q, which has the same capacity as P, costs Rs. 2500 but will have running costs of Rs. 1200 per year for six years, increasing by Rs. 200 per year thereafter. If money is worth 10% per year, which machine should be purchased? [15]

SECTION-IV

7 (a) Distinguish between critical path method (CPM) and Program evaluation and review technique (PERT). [5]

(b) A project has the following time schedule:

Activity	Time (weeks)	Activity	Time (weeks)
1-2	4	5-6	4
1-3	1	5-7	8
2-4	1	6-8	1
3-4	1	7-8	2
3-5	6	8-10	5
4-9	5	9-10	7

(i) Construct the network diagram.

(ii) Compute total float of each activity and identify the critical activities.

(iii) Find out the critical path and its duration. [10]

OR

8. A small project is composed of seven activities whose time estimates are listed in the following table:

Activity		Estimated duration (weeks)		
i	j	Optimistic	Most likely	Pessimistic
1	2	1	1	7
1	3	1	4	7
1	4	2	2	8
2	5	1	1	1
3	5	2	5	14
4	6	2	5	8
5	6	3	6	15

(i) Draw the project network and find the expected duration and variance of each activity.

(ii) Calculate the early and late occurrence times for each event. What is the expected duration of the project length?

(iii) Calculate the variance and standard deviation of project length. What is the probability that the project will be completed at least 4 weeks earlier than expected? [15]

SECTION-V

9. (a) Distinguish between lead time and time horizon. [3]

(b) Define queue length, traffic intensity and the service channels? [3]

(c) Define idle time on a machine in a sequencing problem. [2]

(d) Briefly explain the reasons for replacement. [2]

(e) Define balking and reneging in queuing system. [2]

(f) Define the following terms used in PERT:

(i) Pessimistic time (ii) Optimistic time (iii) Most likely time. [3]

*******ETE MAY 2018*******