

**THAKUR COLLEGE OF SCIENCE AND COMMERCE**  
**SEMESTER III YEAR: 2016 - 2017**

**PROGRAM: S.Y.B.Sc. (AVIATION)**  
**SUBJECT: AIR NAVIGATION**  
**DURATION:**

**MAX. MARKS: 75**

**Q.1. Attempt any one:- (15)**

- 1) State the principle, construction and working of a DGI.
- 2) State the properties and uses of Transverse and Oblique Mercator Charts.

**Q.2. Attempt any one:- (15)**

- 1) State the principle and operation of an Remote Indicating Compass and its disadvantages.
- 2) State the occasions when a compass swing is required to be carried out and the serviceability checks required to be carried out on a compass before swinging?

**Q.3. Attempt any three:- (15)**

- 1) State the principle of GPWS?
- 2) State Kepler's Law.
- 3) State the principle and operation of a Radio Altimeter?
- 4) Define the following:-
  - i) Zenith ii) Apparent Solar Day iii) Sunset iv) Local Mean Time v) Mean Solar Day

**Q.4. Solve the Following:- (15)**

- 1) A/C 'A' leaves place 'X'  $16^{\circ}30'N$   $175^{\circ}30'W$  at 0600 LMT on 14/05/2008 and flies due south at G/S of 200kts. Another a/c 'B' left from place 'Y'  $05^{\circ}00'S$   $155^{\circ}00'W$  at 0600 LMT on 14/05/2008 and flies due west, eventually both aircraft's meet.

Find:-

- a) Place of meeting

- b) G/S of second aircraft
- c) LMT and date of meeting
- d) GMT and date of meeting.

**Q.5. Solve the following:-**

**(15)**

- 1) LMT at  $03^{\circ}27'$  E is 1816, 18th April. What is LMT at  $165^{\circ} 32'$  E?
- 2) LMT at  $179^{\circ} 50'W$  is 2300, 15th December. What is LMT at  $179^{\circ} 50'E$ ?
- 3) What is LMT and date at A ( $30^{\circ}N 170^{\circ}W$ ) when it is 2020 LMT on 28th October at B ( $70^{\circ}S 176^{\circ}E$ )?
- 4) A/C "A" travels in westerly direction from  $25^{\circ}N 45^{\circ}E$  at 0800 LMT at a ground speed of 200 kts. It flies for 4 hrs and reaches the destination "B". Find the following:-
  - a) Co-ordinates of "B".
  - b) LMT and UTC at "b" when aircraft reaches destination.

**-: ALL THE BEST:-**

## THAKUR COLLEGE OF SCIENCE AND COMMERCE

## SEMESTER III

Programme: S.Y.BSc. Aviation

Max Marks: 75

Subject: Aircraft &amp; Engine

Duration: 2:30 hrs

Attempt all questions with options given and must be supported with graphs and diagrams.

Q1 Write short notes on any three of the following 15

- a) Normal Shock Wave
- b) Oblique Shock Wave
- c) Lift Dumpers
- d) Mach Tuck

Q2A Explain the various functions of spoilers. 15

OR

Q2B What is stall? Explain the automatic stall warning systems and stall recovery procedure.

Q3 Write short notes on any three of the following 15

- a) Vortex Generators
- b) Super Stall
- c) Roll Spoilers
- d) Mach Trim System

Q4A Explain the sub-divisions of Aerodynamic flow, Define  $M_{FS}$ ,  $M_L$  and explain  $M_{CRIT}$ . 15

OR

Q4B Write a short note on Mach no and effect on Mach No. of climbing at constant IAS, Variation of TAS with Altitude at a constant Mach no and Influence of temperature on Mach No. at a Constant Flight Level and IAS 15

Q5A Write a short note on Normal shock wave and explain what happens when speed is accelerated beyond  $M_{CRIT}$  15

OR

Q5B Explain Take Off Profile and various segments and Power setting for the same.

THAKUR COLLEGE OF SCIENCE & COMMERCE

ACADEMIC YEAR 2016-17

Programme: S.Y.BSc.  
Course: Aviation – Meteorology.

Semester: III  
Max. Marks: 75.

Q1. Define Any 5: 15

- |                    |                 |                                 |
|--------------------|-----------------|---------------------------------|
| a. Ice accretion.  | b. Frost point. | c. Super cooled water droplets. |
| d. Wind.           | e. Veering.     | f. Lull.                        |
| g. Coriolis force. |                 |                                 |

Q2. Write short note on Any 3: 15

- |                       |                |               |
|-----------------------|----------------|---------------|
| a. Carburettor icing. | b. Rime ice.   | c. Clear ice. |
| d. Hoar frost.        | e. Anemometer. |               |

Q3. Attempt either:

A.

- |   |    |
|---|----|
| a. Explain in detail Anabatic and Katabatic winds.                          | 08 |
| b. Name different types of winds around the world with its place of origin. | 07 |

OR

B. Explain in detail structure of Tropical Revolving Storm. 15

Q4. Attempt either:

A. Define Jet stream and explain all types of jet stream in detail. 15

OR

B. Decode TAF.

15

VILK 241800Z 250009 0900SKT 0800 EG BECMG 0405 09015KT 6000 SCT008 BKN120  
TEMPO 0608 J2015G30KT3000 TSRAFEW012 FEW025CB BKN100 BECMG AT 0800  
09010KT 7000 EEW030 SCT120 BKN280 =

Q5. Attempt either:

A. What are conditions necessary for formation of mountain waves? What aviation hazards are expected with it? 15

OR

B. Decode Metar:

15

a. TEMPO FM0830 TL0900 24025G54KT 2000 RATS FEW020 FEW 020 FEWCB025  
SCT100 BKN 250 BECMG FM0930 27005KT 6000 NSW.

b. VABB 0210Z 33005KT 3000 HZ SCT 015 24/22 Q1011 TEMPO TL0310 1400 BR=

c. VIJO 1230Z 23015KT 5000 SA SKC 37/18 Q1004 TEMPO 1314 24015G28KT -DS 1500  
FEW 015 SCT020CB BKN160=

THAKUR COLLEGE OF SCIENCE & COMMERCE

ACADEMIC YEAR 2016-17

Programme: S.Y.BSc.  
Course: Aviation – Regulation.

Semester: III  
Max. Marks: 75.

Q1. Define Any 5 15

- |                      |                     |                         |
|----------------------|---------------------|-------------------------|
| a. Altitude.         | b. Elevation.       | c. Transition Altitude. |
| d. Transition Level. | e. Tradition Layer. | f. Height.              |
| g. Level.            |                     |                         |

Q2. Attempt either:

A. Write in brief about Suspension and Cancellation of Certificate of Airworthiness. 15

OR

B.

a. What are contents of clearances? 08

b. What are criteria for considering meteorological conditions below minima for a given aerodrome? 07

Q3.

A. With a neat labelled diagram explain TORA, TODA, ASDA, LDA, CLEARWAY and STOPWAY. 15

OR

B.

a. Explain taxiway centreline lights and edge lights along with its specifications. 07

b. What are period of validity of medical assessment and licenses for ATPL, CPL, PPL and SPL? 08

Q4. Attempt either:

A. Define ADIZ. Explain procedure for ADC. 15

OR

B.

a. Explain runway touchdown zone lights and runway edge lights. 08

b. Write a note on Nationality and Registration Marks. 07

Q5. Write short note on any 3 15

a. Smoking in a/c.

b. Position report.

c. Threshold Marking.

d. State Marks.

e. Maximum age of professional pilot.