

VSC SELECTION EXAM-I

TIME: 03 HOURS

TOTAL MARKS-150

MCQs

(20X1=20 Marks)

10. Recommended fuel grade of VIRUS SW-80 aircraft is....
- (a) Unleaded super grade 93 (b) Leaded super grade 93
(c) Unleaded super grade 39 (d) None of the above
11.is to assist the pilots to make an approach for landing in poor visibility or in night.
- (a) Hypoxia (b) Signal Square
(c) Aerodrome Lighting (d) Approach Lighting
12. According to Bernoulli's theorem static pressure decreases as the velocity
- (a) Decreases (b) Neutral (c) Increases (d) None of these
13. Air Vice Marshal of Indian Air Force is equivalent to rank of Indian army.
- (a) Colonel (b) Brigadier (c) Major General (d) Captain
14. The primary responsibility of Indian is to secure Indian airspace and to conduct aerial warfare during a conflict.
- (a) Air Force (b) Army (c) Navy (d) NSG
15. S-400 has operational altitude upto km.
- (a) 185 (b) 285 (c) 85 (d) 155
16. During the War the Prime Minister of India was Atal Bihari Vajpayee.
- (a) 1999 (b) 1971 (c) 1962 (d) 1965
17. The operating cycle (pressure / volume cycle) of a basic aero-engine is called
- (a) Combustion Cycle (b) Compression cycle
(c) Brayton cycle (d) Induction cycle
18. Air brakes are Controls
- (a) Primary (b) Secondary
(c) Auxiliary (d) None of these
19. A Component converts the turbine RPM to an appropriate level for the propeller is called:
- (a) Turbine (b) Single Shaft
(c) Free Turbine (d) Reduction gear box
20. Sir George Caley built helicopter model in
- (a) 1796 (b) 1797 (c) 1798 (d) 1799

FILL IN THE BLANKS

(20X1=20 Marks)

21. DFC stands for Distinguished Flying Cross
22. The name of the party of Sheikh Mujibur Rehman was East Pakistani Awami League.
23. In Piston engine air intake assists in induction of air.
24. Most gliders are equipped with spoilers on the wings in order to adjust their angle of descent during approach to landing.
25. A raised aileron reduces lift on that wing and a lowered one increases lift.
26. General airplane lift equation is $L = \frac{1}{2} \rho V^2 S C_L$
27. The depth of Transition Layer will normally be insignificant, and will in any case never exceed 500 ft.
28. Distance of shoulders in Runway Marking is 150 Feet.
29. In RT procedures and phraseology the letter Q is said Quebec.
30. Valsalva technique, that is, to close the mouth, hold the nose and blow gently.
31. Recommended lateral displacement for downwind leg is 0.7 NM.
32. Care must be taken not to exceed 70 Kts / 55 Kts during recovery from stall with Flaps 15° / Flaps 25°.
33. During Engine warm, Engine throttle to be set to 2500 RPM, till oil temperature reaches 50 deg C.
34. Maximum wind speed for parking outdoors with tie down is 40 Kts.
35. Manifold Pressure (MAP) displayed in millimetre of Hg, without warning.
36. Battery of ML aircraft is capable of operation within a temperature range of -30 deg Celsius to + 60 deg Celcius, with a maximum operating altitude of 5000 metres.
37. AFFF compound for extinction of hydrocarbon and polar solvent fires, the full form of AFFF is Aqueous Film Forming Foam.
38. Firewall is reinforced by heat and noise insulation using glass-flame retardant sandwich.
39. Fuel flow Display available only when more than 10 ltr fuel is available in tank.
40. Minimum height to commence the manoeuvre of stall is 1500 ft AGL.

WRITE THE SHORT NOTE ON FOLLOWING

(20x5=100 Marks)

41. The composition of dry air by volume is as

- (a) Nitrogen 78.09 %
- (b) Oxygen 20.95 %
- (c) Argon 0.93 %
- (d) Carbon dioxide 0.03 %

42. Layers of Atmosphere are...

- (a) Troposphere is Up to about 11-16 km
- (b) Stratosphere - Up to about 50 km above troposphere
- (c) Mesosphere - 50 to 85 km
- (d) Thermosphere - Above 85 km

43. Classification of Clouds

High Clouds 20,000 feet and above Cirrus, Cirro-Stratus, Cirro-cumulus

Medium Clouds 6500 feet to 20,000feet Alto-Stratus, Alto-Cumulus,

Low Clouds Ground level to 6500 feet Stratus, Strato-Cumulus.

Clouds with vertical Base 1500 feet to 6500 feet Cumulus, Cumulo-Nimbus.
development but tops reaching high and medium cloud levels.

44. What are the types of Precipitation?

- (a) Drizzle. Minute water drops falling from the clouds. The drops are so small that they look like spray and are at times blown and carried by wind.
- (b) Rain. Medium size water drops falling from layer types of clouds.
- (c) Snow. Frozen rain in the form of flakes or ice crystal.
- (d) Sleet. Mixture of rain and snow.
- (e) Shower. Large drops falling from heap type of clouds.
- (f) Thunder storm. A phenomenon in which thunder is heard and lightning is seen. Generally accompanied by sharp shower. They are associated with Cb clouds.
- (g) Hail storm. A storm in which solid pellets of ice fall on the ground.

45. Various types of wings

They are as follows:

- (a) Straight wing
- (b) Swept back wing
- (c) Delta wing
- (d) Tapered wing
- (e) Variable geometry wing

46. What is Artificial Horizon?

The artificial horizon shows the aircraft's attitude relative to the horizon. From this, the pilot can tell whether the wings are level and if the aircraft nose is pointing above or below the horizon. This is a primary instrument for instrument flight and is useful in conditions of poor visibility. An artificial horizon is an instrument used in an aircraft to inform the pilot of the orientation of the aircraft relative to earth. It indicates pitch (fore and aft tilt) and bank or roll (side to side tilt).

47. Basic tools of Aeromodelling?

- (a) Screw driver
- (b) Hand drill
- (c) Sand paper and pins
- (d) Pliers
- (e) Knives with different blades
- (f) Different kind of saw
- (g) Files. Soldering irons
- (h) RC set (Transmitter, Receiver).

48. What are the Specifications of International Standard Atmosphere?

Specifications of International Standard Atmosphere are

- (a) Mean Sea level temperature 15°C
- (b) Mean Sea level pressure 1013.25 mb
- (c) Surface density 1225 g/m³
- (d) Acceleration due to gravity 980.665 cm / sec²
- (e) Rate of fall of temp with height up to 11 km 6.5°C / km (1.98°C / 1000 ft)

49. Write Objectives of Air Traffic Services.

- (a) To prevent collision between aircraft.
- (b) To prevent collision between aircraft on the maneuvering area and obstructions on that area.
- (c) To expedite and maintain an orderly flow of traffic.
- (d) To provide advice and information useful for the safe and efficient conduct of flights.
- (e) To notify appropriate organisations regarding aircraft in need of search and rescue aid and assist such organisation as required.

50. Write Short Note on Operation Safed Sagar?

Operation Safed Sagar was the code name assigned to the Indian Air Force's strike to support the Ground troops during Operation Vijay that was aimed to flush out Regular and Irregular troops of the Pakistani Army from Indian Positions in the Kargil sector along the Line of Control. It was the first large scale use of air power in the Jammu and Kashmir region since the Indo-Pakistan War of 1971. 30

Ground Operations. Initial infiltrations were noticed in Kargil in early May, 1999. Because of the extreme winter weather in Kashmir it was common practice for the Indian and Pakistani Army to abandon forward posts and reoccupy them in the spring. That particular spring, the Pakistan Army reoccupied the forward posts before the scheduled time not only theirs but also the posts which belonged to India, in a bid to capture Kashmir. 12. By the second week of May, an ambush on an Indian army patrol acting on a tip-off by a local shepherd in the Batalik sector led to the exposure of the infiltration. Initially with little knowledge of the nature or extent of the encroachment, the Indian troops in the area initially claimed that they would evict them within a few days. However, soon reports of infiltration elsewhere along the LoC made it clear that the entire plan of attack was on a much bigger scale. India responded with Operation Vijay, a mobilization of 200,000 Indian troops. However, because of the nature of the terrain, division and corps level operations could not be mounted; the scale of most fighting was at the regimental or battalion level. In effect, two divisions of the Indian Army numbering 20,000, along with several thousand from the Paramilitary forces of India and the Air force were deployed in the conflict zone. The Indian Army moved into the region in full force. Soon, the intruders were found to be well entrenched and while artillery attacks had produced results in certain areas, more remote ones needed the help of the Air force.

51. What is Flutter, Explain it?

Flutter.

- (a) Defined as oscillation of control surfaces. Caused by abrupt control deflections at speeds close to or in excess of VNE
- (b) Indications. Ailerons elevators or even the whole aircraft starts to vibrate violently
- (c) Increase angle of attack (pull stick back) and reduce throttle immediately to reduce speed
- (d) Increase load (damping) on structure Note. Fluttering of control surfaces may cause permanent structural damage and / or inability to control the aircraft. After landing, aircraft must undergo series of checks to verify air worthiness.

52. What do you mean by Spin in aircraft and how to recover from it?

Spin Recovery.

Once spinning, intentionally or otherwise, effect recovery as follows.

- (a) Set throttle to idle (lever fully back, in case of unintentional spin)
- (b) Apply full rudder in direction opposite to spin
- (c) Move stick centrally and progressively forward
- (d) As aircraft stops spinning, stop stick movement and centralise rudders
- (e) Check speed 50 Kts and slowly pull up to regain horizontal flight, opening throttle simultaneously. Do not stress the aircraft during pull out

53. Explain Descent Procedure.

Descent Procedure

Prior to descent, obtain RT permission from the ATC and confirm rejoin instructions. Once cleared to descent, orientate with respect to the destination airfield, select throttle to idle and as speed approaches VNO or below, lower attitude to maintain speed below VNO, while losing altitude.

During descent, if throttle on idle setting, ensure throttle is opened slightly for short periods of time, to ensure spark plugs do not turn dirty.

54. Write down the Limitation of Aircraft?

- (a) Maximum wind speed for parking outdoors without tie down is 15 Kts.
- (b) Maximum wind speed for parking outdoors with tie down is 40 Kts.
- (c) Flying in side slip turbulence may result in non precise fuel quantity indication.
- (d) Soft grass runways (unpaved) tend to increase take off performance data by 20 %.
- (e) Headwinds shorten take off and landing length required by 8 mtrs for every 3 Kts / 5 Km/h of increase in wind speed.
- (f) Tailwinds extend take off and landing length required by 18 – 28 mtrs for every 3 Kts / 5 Km/h of increase in wind speed.
- (g) Tailwinds affect take off and landing performance by more than twice, as much as headwind does.

55. Write down the final approach checks?

Final Approach (Checks on Finals)

- (a) Alignment correct

- (b) Throttle to idle
- (c) Perspective correct
- (d) Speed below 55 knots, select flaps to position '2' (Flaps 25°)
- (e) RT call. Maintain speed 50 knots

56. What is stall, Write down Internal check before Stall?

Internal checks before Stall.

- (a) Height sufficient for recovery (Minimum 1500 ft AGL)
- (b) Airframe configuration (Clean / Flaps 15° / Flaps 25°)
- (c) Engine Parameters within limits
- (d) Location, sufficient sector length available

57. What do you understand with Rough engine operation or engine failure in flight?

Rough engine operation or engine failure in flight

- (a) Ensure correct air speed 64 Kts
- (b) Start analyzing terrain below
- (c) Choose most appropriate site for landing out
- (d) Provided engine failed aloft, react as follows.
- (e) Ensure Master switch is in ON position
- (f) Magneto switches both set to ON
- (g) Fuel valve open
- (h) Attempt to restart the engine
- (i) If unsuccessful, begin with landing out procedure immediately

58. How will you come to know that Electric Fuel Pump has failed during engine operation and what action you take to recover the engine?

- (a) Indication. Either through engine switching off or zero fuel pressure indication. In case of partial fuel pump failure, fuel pressure will be indicated low.
- (b) Attempt to reduce power to increase fuel pressure to achieve more reliable engine operation Note. For normal flight operation, mechanical fuel pump provides adequate fuel pressure. Electrical fuel pump is a safety option to suppress eventual fuel vapour.

59. What is cold start; explain the starting procedure of engine?

- (a) Check fuel quantity sufficient for duration of flight
- (b) Confirm Pitot cover removed
- (c) Confirm Parachute safety pin removed
- (d) Engage wheel brakes and apply parking brakes
- (e) Check fuel valve open, fuel CB IN, fuel pump on (by sound)
- (f) In case of cold start, select choke fully open by pulling choke lever fully back
- (g) Select Avionics OFF and both magnetos ON
- (h) Check area around and propeller area clear. Take clearance from ground crew for start
- (i) Engage starter button till engine starts (not more than 10 seconds, in one go)
- (j) Select Avionics switch ON
- (k) Check oil pressure registering and within limits
- (l) Set throttle to adjust RPM below 2500
- (m) Select choke lever fully forward (Closed) while maintaining RPM
- (n) Check Engine parameters normal

60. After entering the cockpit what procedure will follow before engine start?

To enter the cabin, first lift the door all the way to the bottom wing surface. The silver knob will grab and secure the glass door in position. Sit onto the cabin's edge and support body by placing both hands on to the cabin edge. Drag oneself into the seat, lifting only one leg over the stick for best position. Immediately after having sat into the seat, check rudder pedals position to suit size and needs by pulling the round black knob ahead of the stick on the floor. Position of pedals may also be adjusted during flight. To lower door, do not attempt to grab and pull door handle, but gently pull the silver knob instead. To close door securely, rotate the handle so that it locks and verify that all three closing points are secured. Fasten seat belts according to size, with the help of ground crew.

Put on the headsets and adjust mic position.

- (a) Select Master Switch ON.
- (b) Avionics switch ON.
- (c) Check all instruments and EMS display ON
- (d) Select intercom switch ON, RT set ON, Check reading str 5
- (e) Obtain permission from ATC for start up.
- (f) Remove safety pin from Parachute Emergency Release Handle

TRUE / FALSE

(10x1=10 Marks)

61. During War Time, Aircraft recognition helps the MOP (mobile observation post) to identify the Aircraft as friend or foe. It also helps to know the capability of the aircraft by identifying its type. **True**

62. Gas turbine engines are divided into two main classes. They are Turbo jet engine and Turbo Fan engine **False**

63. The construction/building of static models is one of the main events in all India level competitions like AIVSC and RDC. **True**

64. Air Traffic Control officers work under the directions of Chief Engineering Officer. **(False)**

65. Control surfaces in Microlite A/C are operated electrically. **(False)**

66. Mountains and hills are not used as valuable land mark for Navigation. **(False)**

67. The objective of Lubrication system is to wash away the burs released while sliding the parts when they are moving. **(True)**

68. Parasite drag is produced in the flight by Fixed under carriage **(True)**

69. To control YAW rudder is moved with help of **Yoke Control**. **(False)**

70. Static aero models are miniature replicas of original aircrafts. **(True)**