



Question Papers and Report of the
Assessors and the Examiners for the
Qualifying Examination for
Promotion to the Rank of
Sub-Officer
Part I: Written Examination 2000

QUESTION PAPERS AND REPORT OF THE ASSESSORS AND EXAMINERS FOR THE QUALIFYING EXAMINATION FOR PROMOTION TO THE RANK OF SUB-OFFICER PART I WRITTEN EXAMINATION 2000

GENERAL COMMENTS

The fifteenth examination conducted by the Fire Services Examinations Board produced a pass rate of 18.6% from 1345 candidates who sat the examination. Although it is difficult to compare these results with those of last year, they show a decrease in the previous year's pass rate (27.2%) and a decrease of 201 (13.0%) in the number of candidates sitting the examination.

This was the first application of the new examination format using four papers with only subjective questions, all of which needed to be answered as opposed to the previous use of three papers, each of which provided a choice of subjective questions together with some using objective questions.

The examination now includes additional papers that relate to Fire Safety, Education and Enforcement (Paper 2), Human Resource Management (Paper 3) and Business Administration (Paper 4). As these subjects are new to the examination, it is essential that candidates effectively work through the Study Notes relating to them and understand the subject matter.

It was evident that numerous candidates had made a significant effort to prepare themselves for the examination which was evidenced by the quality of their answers. Unfortunately, these were in the minority and it remains apparent that many had not adequately prepared themselves or studied the bibliography.

Reliance on day-to-day experience for examination purposes without studying the established bibliography will invariably never be sufficient to achieve a successful result.

Assuming that a reasonable level of study has been satisfied, it then only remains for the candidate to apply basic care and examination technique to the questions set in order to achieve the required result.

As regards study, for the purposes of operating a level playing field for candidates, only the established bibliography for each paper is used when setting the questions and creating the marking guide for the answers. It is impossible, and would be incorrect, to endeavour to accept what may be policies or procedures applied in brigades. Candidates must be encouraged to study the bibliography for the examination in order to provide themselves with a reasonable chance of success. Equally, the knowledge gained will be useful during the candidate's progress in their fire service career, especially if success brings an increase in rank and, with it, additional responsibilities.

As regards to examination techniques, candidates are advised to follow the instructions given. If the question requests you to "list", "explain briefly" and "describe", it does so because it is considered that this will provide the best format for the candidate to use.

The careful reading of the question is a basic requirement. The questions contain no hidden catches. The stem of the question, when provided, will give the background to it and then establish the information required from you, together with the format in which to provide it. The provision of information beyond that required is invariably unnecessary and takes up valuable time. Unfortunately, this provision of additional information usually indicates a lack of knowledge of the information sought by the question, but is submitted in the hope that marks will be awarded. Candidates are advised that if the information provided does not relate to the information required by the question, no marks will be awarded no matter how correct the detail provided might otherwise be.

Finally, in order to ensure that the marking of their papers provides no additional problems, candidates should follow these basic rules:

- Always use a pen and not a pencil to write your answers.
- Start each question on a new page in your answer book and write the number of question in the box provided for it on the top of the page.
- Always prepare your answer in your mind or on rough paper before applying it to the answer book.
- When you believe that you have completed each paper, read the questions yet again and carefully read the answers that you have provided to them. Obvious discrepancies which would otherwise fail to obtain marks may easily be identified and then corrected.

The following pages contain the detailed comments of the Assessors and Examiners and a careful study of them should be beneficial to future candidates.

PAPER 1: OPERATIONS

GENERAL COMMENTS

Overall, this paper was very poorly answered. Whilst there were some good scripts, the majority failed to reach a satisfactory standard.

This provided some concern in view of the fact that for the most part, the questions were structured around basic operational procedures which candidates should have been able to relate to.

Too many candidates used “in vogue” statements such as “carry out a dynamic risk assessment” in the hope that they would gain marks. Many scripts produced phrases like “call in specialist teams to deal with the situation” without detailing the procedures which were actually required.

Brigade Training Officers should take particular note that the answers provided to the questions relating to Incident Command Structures and Incident De-briefing were particularly poor, two areas which even firefighters should have some basic knowledge of.

Whilst the safety of personnel is important, many candidates spent too much time detailing the rigging of crews in personal protective equipment, in some cases almost to obsessive levels. Detailing the operational procedure required by the questions became a secondary issue and many answers failed to attract available marks because of this.

Some scripts had worrying aspects in them, which if enacted on the incident ground could have serious consequences. Whilst specific instances were rare, all Senior Officers, particularly Training Officers, should take note of the comments made on individual questions.

SECTION A OPERATIONAL PROCEDURES AND INCIDENT COMMAND

Attempt BOTH questions

- 1 As a Sub-Officer you are making a presentation to your watch about Incident Command Structures. Describe the advantages of using an Incident Command Structure, and why the use of standard terminology is advisable. (25 marks)

Bibliography: Fire Service Manual Volume 2, Incident Command, Chapter 2, pages 10 - 16.

This question did not attract a high level of satisfactory marks and was poorly answered with only a limited number of good scripts. This was disappointing in a subject area that has attracted a lot of interest nationally, resulting in the production of the Fire Service Manual "Incident Command" in 1999.

Some of the terms used were not classed as "standard terminology" for example gold, silver or bronze zones, and as such did not attract any marks.

Many candidates gave long examples of Dynamic Risk Assessment which was not asked for in the question.

In general, candidates did not answer the question asked, resulting in long answers which did not attract marks. Candidates must read the question with sufficient care to identify the information it seeks.

-
- 2 You were the initial Incident Commander for a 3-pump fire at a fire involving an industrial unit that developed into a multi-pump incident. The fire was successfully extinguished with no injuries to Fire Service personnel or members of the public.
- Identify and discuss briefly the FOUR appropriate levels of analysing and evaluating the performance of crews at this incident and the possible outcomes arising from them. (25 marks)

Bibliography: Study Note 2101, Analyse and Evaluate an Incident, pages 4 and 5.

The majority of candidates successfully identified the four appropriate levels required by the question, but then failed to give sufficient details for each.

Many candidates failed to obtain available marks by not identifying that the factors, evaluating, analysing, learning outcomes and training needs were common to each area, but applied at these different levels.

Candidates must understand that de-briefs occur after an event and the answer did not seek comments on the stages of an incident, particularly in relation to en-route actions etc.

SECTION B FIREFIGHTING AND RESCUE INCIDENTS

Attempt BOTH questions

- 3 You are the Sub-Officer in charge of the initial attendance at an incident involving an unignited leakage of Liquefied Petroleum Gas (LPG) from a static tank situated in a residential area. Discuss briefly:
- (a) the problems likely to be encountered; (6 marks)
- and
- (b) the actions you would consider to reduce the risk and make the situation safe. (19 marks)

Bibliography: Manual of Firemanship Part 6c, Chapter 45, Section 5, pages 127 and 128.

Considering the potential risks of this type of incident, the level of knowledge generally displayed by candidates was poor.

Candidates who stated that they would “undertake a dynamic risk assessment and then deploy the appropriate control measures”, gained no marks, unless they described the actions they would take.

Some candidates did provide excellent answers where they described their thought processes during their assessments, gaining high marks.

A large proportion of the answers were confused by the inappropriate use of “upwind/downwind” and one can only hope the difference is recognised in practice.

Candidates who stated “select the appropriate PPE” did not gain marks unless they explained things more fully.

Candidates are reminded that only in exceptional circumstances should personnel enter the gas cloud, but a large number of scripts articulated “the minimum numbers in the risk area”.

Many gave answers relating to cooling the tank – it was not on fire. It was neither a cylinder nor a road tanker. Some candidates also related to a liquid spill and dealt with environmental contamination. It should be recognised that the hazard with LPG is the vaporisation of the stored liquid into a gas cloud and its possible ignition. Many candidates were misguided by digging trenches and using sandbags when concentration should be on mitigating the risk of ignition, evacuation, dispersal of the gas and stopping the leak.

Overall this was a poor response to a realistic fire service operational scenario.

- 4 You are the Sub-Officer in charge of the initial attendance responding to a 'Trench Collapse, Persons Trapped'. Upon arrival you are confronted with a partial collapse to a deep trench, where a worker is trapped at the base of the trench with colleagues attempting a rescue. What are your initial considerations and actions?

(25 marks)

Bibliography: Fire Service Guide to Health and Safety, Volume 3 – Guide to Operational Risk Assessment, Section 2.5, pages 35 and 36.

The standard of responses were far from adequate with some candidates asking inappropriate and insensitive questions such as "is the casualty injured".

Far too much emphasis was put on the "comfort" of firefighters (fireground feeding, relief crews etc) whilst almost totally ignoring the extricating of the casualty.

The breadth of vision displayed by candidates was limited and failed to include basic issues such as crew safety (rescue lines, safety procedures and the provision of safety officers).

The level of marks achieved was disappointing with no one obtaining full marks and numerous scripts failing to gain marks by not identifying that Fire Service and non-fire service resources may be of value in the extrication.

The standard of communication ability shown by the candidates was very poor. However, this was ignored by the examiners who made every effort to interpret very poor spelling, grammar and handwriting.

SECTION C SCIENCE AND FIREFIGHTING

Attempt BOTH questions

- 5 (a) Define the term 'flame'. (4 marks)
- and
- (b) What is meant by the term 'Stoichiometric mixture'? (3 marks)
- and
- (c) Name and describe the TWO main types of flame. (18 marks)

Bibliography: Fire Service Manual Volume 1, Physics and Chemistry for Firefighters, Chapter 7, Sections 7.1 - 7.6.2, Pages 47 – 53.

This was an unpopular question with many candidates failing to submit an answer.

In Section (a), few candidates went beyond stating that a flame was a chemical reaction from which heat and light evolved. Consequently few, if any, attained all the available marks.

In Section (b), most candidates failed to explain the term "Stoichiometric mixture". Some went on to give specific examples which did not enhance the quality of the answer provided.

Other candidates gave a detailed description of "flammability limits" including a graph which was informative, but not asked for.

Many candidates were able to name the two types of flame in Section (c) but few went on to provide a description of their characteristics. Those who used the practical examples of the "bunsen burner" and 'candle flame' in their answers, achieved valuable marks.

The quality of answers was poor. Candidates demonstrated an appalling lack of understanding of the basic chemistry of the flame.

It was apparent that few candidates had effectively studied the bibliography.

- 6 You have arrived at a large fire and the officer-in-charge has directed you to provide an adequate supply of water for firefighting from a river located some distance away using a water relay.

Discuss the problems that may be encountered and the good working practices that should be employed to increase the efficiency of the water relay in each of the following areas:

(a) the base pump; (6 marks)

and

(b) spacing between the first and second pump in the relay; (6 marks)

and

(c) charging the water relay system with water. (13 marks)

Bibliography: Manual of Firemanship Book 7, Part 4, Chapter 16, Section 5, pages 159 – 161.

Many candidates attempted the question from a practical pump operator's perspective rather than that of a Crew Commander.

In-depth detail regarding how to secure suction hose etc was not required and candidates spent valuable time, and thus failed to obtain marks, by describing precise pump operating procedures.

Relying on practical experience to answer this question should have assisted candidates, but the answers provided let many candidates down. In addition, many did not take the number of marks allocated to each Section into account when formulating their answers. and provided lengthy answers to parts (a) and (b) with little information provided for part (c).

PAPER 2: FIRE SAFETY, EDUCATION AND ENFORCEMENT

GENERAL COMMENTS

Even though this was a new format, examination candidates had a reasonably good chance to predict the likely topics for questions because of the fairly restricted bibliography. Nevertheless, it was obvious that a considerable proportion of candidates had not studied appropriately and relied upon previous experience to hopefully get them through. This approach scored poorly and so reflected on a candidate's capacity to achieve sufficient marks to pass the paper.

It was also apparent that some candidates did not read the whole question and so failed to obtain the marks available. This has been said countless times before and the importance of reading the question and understanding it are simple but critical rules to applying a successful examination technique.

Furthermore, a small but significant number of candidates did not adhere to the instructions in the answer books and so produced untidy work that was difficult to mark.

SECTION A FIRE DEFENCE AND ALERTING SYSTEMS

Attempt ALL questions

1 (a) In relation to electrical fire alarm systems for buildings, what are Type 'L', Type 'P' and Type 'M' systems for? (6 marks)

and

(b) With regard to an ionisation smoke detector:

(i) detail its operational design features;

and

(ii) describe how it operates in fire conditions. (19 marks)

Bibliography: Study Note 2201, Fire Detection, Alarms and Transmission System, pages 3, 4 and 5.

It was disappointing to note the lack of understanding in the basic operating principals of an ionisation smoke detector

Candidates are reminded it is the action of the radioactive source not heat from a fire that releases electrons from an atom of air to cause ionisation to take place.

Those who read and took sufficient care to understand the requirements of the question were able to draw on the information obtained by studying the bibliography, provide clear concise answers and thus obtain high marks.

However, candidates who clearly had not fully understood what was required and went to great lengths to describe optical detectors failed to attract marks for their efforts.

2 During a fire safety inspection of a business unit development, you are told that the owner is considering installing sprinklers in each of the units as they become vacant and before new tenants move in.

Explain briefly the FOUR different types of sprinkler systems. (25 marks)

Bibliography: Study Note 2202, Fire Detection, Alarms and Transmission System, pages 12, 13 and 14.

A reasonably well answered question, but marks failed to be obtained by candidates who did not read the question with sufficient care.

Several answers included details of drenchers and deluge systems, indeed, any type of fixed installation, the distinction between these and sprinklers being either missed or misunderstood.

3 Your watch is undertaking a 1(i)(d) visit to a single storey factory building. You notice that the building is fitted with an automatic venting system. As you have a probationer firefighter in the crew you decide to use the opportunity to explain about venting systems. Describe:

(a) briefly the TWO methods of actuating a venting system. (7 marks)

and

(b) how automatic venting facilitates firefighting. (18 marks)

Bibliography: Manual of Firemanship Book 9, Chapter 19, pages 149 – 152.

The question turned out to be extremely difficult for the vast majority of candidates, clearly indicating a lack of knowledge of the relevant bibliography.

Despite numerous reminders over the years in past examination reports, candidates still fail to read the question fully. "Describe briefly" does not mean "list" - some form of explanation is required to achieve available marks.

Many candidates omitted to provide a brief description in their answers

Part (b) clearly asked the candidates to describe how the systems "facilitates firefighting", yet many scripts concentrated on the benefits for escaping employees.

SECTION B FIRE INVESTIGATION

Attempt ALL questions

- 4 (a) Detail your understanding of the term 'arson'. (9 marks)
- and
- (b) In note form, list and explain briefly the broad categories of motives for a person to commit arson. (16 marks)

Bibliography: Manual of Firemanship Book 12, Chapter 15, pages 223 – 225.

Many candidates achieved a high overall mark to the question despite poor responses to part (a).

Many answers were jumbled even though the question suggested the provision of a structured list. Tidiness and concise expression is easier for the examiner to mark.

The first (and probably more difficult) part of the question was rarely answered well with only a small number of candidates attracting all the available marks.

A somewhat popular but, non-technical definition of arson was not adequate. The legal definition in the bibliography is quite complex and care was necessary when expressing the answer, even in candidates "own" words in order to display an understanding.

It was clear that many candidates had not prepared well.

5 You are the Sub-Officer in charge of a two-pump attendance at a house fire where there are no casualties.

You now have to investigate the cause of the fire. Describe:

(a) your initial actions including anything you would do from the time you first booked in attendance at the fire. (9 marks)

and

(b) your routine for conducting the investigation proper. (8 marks)

and

(c) how you would conclude the investigation. (8 marks)

Bibliography: Manual of Firemanship Book 12, Chapter 14, pages 209 and 210.

This question was answered more with the apparent application of practical experience rather than any knowledge obtained by a careful study of the bibliography.

Much time and effort was expended on detailing:

- fire fighting procedures;
- signs of fire spread, rather than giving the routine to be conducted; and
- actions for fatalities, even though the question stated that there were no casualties.

Those candidates who requested the attendance of the brigade's fire dog provided little chance of the examiners recognising any depth of knowledge of the subject and, therefore, marks.

6 Your Brigade is working with a local partnership to target an area within your station ground which has a high incidence of arson.

List and explain briefly TEN general indicators which might suggest that arson is the cause of fire. (25 marks)

Bibliography: Manual of Firemanship Book 12, Chapter 15, page 226.

A well answered question with many candidates scoring high marks.

Although the question was quite specific as to what was required, unfortunately many candidates answered by giving specific reasons for arson and this approach did not attract marks.

Regrettably many candidates relied on what seemed to be their experience to answer the question and this resulted in a number of scripts attracting few marks.

PAPER 3: HUMAN RESOURCE MANAGEMENT

GENERAL COMMENTS

This is the first year that this style of examination has been used and it was very disappointing to note that few candidates appeared to have invested any significant effort in studying the bibliography. This is despite the relative ease of covering the areas of assessment through the provision of Study Notes. Those candidates who had considered the study areas were rewarded with high marks.

Questions 1: sought to assess a reasonable level of awareness of absence monitoring systems and was considered particularly relevant given the recent thematic review of this aspect of fire service management.

Question 2: examined awareness of performance management frameworks at station level and what action is needed to deal with poor performance. Performance management and continuous improvement are key areas of "Best Value" and it is important that Sub-Officers are aware of this area.

Question 3: asked candidates to describe a basic aspect of training and should be considered very much the "bread and butter" of the Sub-Officer's role.

Question 4: simply looked at individual performance review mechanisms.

Question 5: sought awareness of accident investigation procedures which is increasingly becoming an important area of work in terms of ensuring safer workplaces for our personnel.

Question 6: focussed on the hypothetical situation of the discovery of a COSHH substance which requires the Sub-Officer to identify the relevant control measures to use.

Overall, despite these areas being very clearly relevant to the role of a Sub-Officer, there were a significant number of candidates who were unable to even attempt an answer to a single question. Not only is this a waste of time and effort for everyone else concerned with the examination, it also begs the question whether this demonstrates a complete lack of knowledge and, by implication, the competence of those individuals who are currently serving in Brigades?

SECTION A EMPLOYMENT

Attempt BOTH questions

- 1 A firefighter returns to duty following a period of sickness absence.
- (a) What procedures would the watch Sub-Officer be responsible for as part of the sickness control system? (15 marks)
- and
- (b) What are the consequences to the Brigade of high rates of sickness absence? (10 marks)

Bibliography: Study Note 2301, Absence through Sickness, pages 2 and 3.

Candidates who had taken the time to effectively read the Study Note tended to score good marks with a handful of scripts attracting full marks. Many candidates simply related what seemed to be their brigade's procedures for personnel returning from sick leave, rather than answer the question based on the Study Note. Unfortunately, a great deal of irrelevant information was included which attracted no marks.

Part (b) of the question provided candidates with an excellent opportunity to secure valuable marks and many candidates attained higher marks in part (b) than part (a).

Should candidates wish to refer to forms by the purpose they serve e.g. Sickness/Absence Record Form or Interview Record Form this would be far more useful than using the brigades forms eg FS226, FSS1 etc.

- 2 As the Watch Sub-Officer, you identify instances of poor performance by a firefighter.
- (a) In conducting an informal discussion with the firefighter, describe the areas that you would cover and what record you would make of the interview. (18 marks)
- and
- (b) Should the firefighter's performance not meet the satisfactory standard at the end of the assessment period, what action would you take? (3 marks)
- and
- (c) Outline the further stages of the procedures should the firefighter's performance not improve. (4 marks)

Bibliography: Study Note 2303, Procedure Relating to Performance, pages 3 and 4.

Generally a fairly well answered question, particularly in relation to part (a), which centred around the actions of a watch/crew commander.

The question as a whole was clearly one which candidates felt they could "have a stab at". This resulted in many lengthy scripts which moved into Welfare or Discipline areas which attracted few marks.

Candidates who achieved a satisfactory level of marks had clearly read the Study Note and had not relied on experiences alone. This was also very evident by the way candidates laid out successful answers by using bullet points, needing little expansion, in order to achieve high marks.

SECTION B TRAINING AND DEVELOPMENT

Attempt BOTH questions

3 As a Sub-Officer, you have been asked to prepare a scenario based training event.

List the aspects that you would cover at the:

(a) briefing; (17 marks)

and

(b) de-briefing. (8 marks)

Bibliography: Study Note 2306, Scenario Based Training, pages 6 and 8.

In general, despite all questions being compulsory, not all candidates attempted this question. A simple list was required setting out, in a logical sequence, the main aspects that would be required. It was evident that many candidates simply did not read the question correctly, going on to write a long script on the health and safety aspects required for individuals, based around a station drill. The question sought an answer based on a generic risk assessment approach and associated control measures. It was apparent that candidates were relating to personal experiences in crew briefing and had not identified the suitable response from the study material. Many marks failed to be obtained due to important items not being listed that are essential in pre-planning. Part (a) was answered more comprehensively than part (b).

Again, this could be aligned to candidates being more confident with debriefing drills/exercises than planning scenario based exercises.

4 As the Watch Sub-Officer, you are responsible for assessing the performance of the personnel on your Watch.

(a) When should individual performance reviews take place? (3 marks)

and

(b) Explain how and why you would carry out each type of review. (22 marks)

Bibliography: Study Note 2304, Assessment in the Workplace, pages 6 and 7.

The question was poorly answered by the majority of those candidates who attempted it. Very early in the marking session, it became obvious to the examiners that candidates had not effectively studied the relevant bibliography and were relying on local knowledge to gain marks.

It cannot be emphasised strongly enough that candidates must study the relevant bibliography; read the question; analyse what is being asked; and communicate their analysis effectively in written terms.

This question related to a very topical and important element of Human Resource Management and candidates could have obtained the marks by producing a simple list of the three performance review types (ie at predetermined intervals, as a risk critical response or at the request of the individual) and thereafter a short, descriptive paragraph relating to each.

SECTION C HEALTH, SAFETY AND WELFARE

Attempt BOTH questions

- 5 You are asked to carry out an initial accident investigation, the first part of which is to collect evidence. Explain:
- (a) how you would collect evidence; (5 marks)
- and
- (b) from whom you would collect evidence; (6 marks)
- and
- (c) the problems involved in gaining witness evidence. (14 marks)

Bibliography: Study Note 2307, Accident Reporting and Investigation, pages 6 and 7.

This was a poorly answered question, with many candidates relying on their own experience, however limited and not the information within the bibliography. Some candidates confused "Accident Investigation" with "Fire Investigation".

It was evident that many of those who had studied the bibliography then failed to deal with the issues in a logical sequence and missed the opportunity to gain high marks. The outcome of this was that examiners considered that candidates did possess the knowledge but had failed to express themselves in a manner which enabled examiners to confirm that candidates knew the answer.

Candidates can only be marked on the actual information given.

- 6 You are asked to carry out a COSHH assessment of the fire station and you identify a substance that requires control measures.

Identify and explain briefly the control measures that can be used. (25 marks)

Bibliography: Study Note 2308, The Control of Substances Hazardous to Health Regulations 1999, page 6.

The application of common sense and understanding of what to do to reduce the risk of hazardous substances in the workplace is all that this question required as an acceptable answer. Identify the application of elimination, substitution, separation, engineering controls, safe systems of work and the provision of suitable personal protective clothing as means of controlling the risk, would have indicated a level of knowledge and understanding that would have provided many useful marks.

It was disappointing to note that many candidates showed no understanding of the subject and consequently failed to achieve any marks, with many more candidates failing to even attempt the question.

It is of some concern to realise that when the practical application of this knowledge is realised, many of the answers provided by candidates, or lack of them, indicates that they are ill-prepared to know how to effectively deal with a hazardous substance at an incident, on the station or at home.

PAPER 4: BUSINESS ADMINISTRATION

GENERAL COMMENTS

It was rewarding to note the number of candidates who achieved a pass in this paper. Indeed there were some very good answers on both questions. The specific comments on each question are attached but the overall message coming out of the scripts is as follows.

Read the question, eg when asked to show working, show working;

When asked to round up, round up;

When asked to draw a graph, a free-hand, scrappy, badly labelled attempt will not suffice. Candidates should ensure that the ranges are appropriate and that the bars or lines are scaled in accordance with them. Clear and appropriate labelling is required.

Attempt BOTH questions

1 A rectangular area measuring 25m long x 15m wide x 3m deep is to be filled to half its depth with water. There are two solid cylindrical structures in the area, each measuring 2m in diameter and 3m high.

(a) Using the quick formula for calculating the volume of a cylinder ($0.8D^2 \times H$), calculate how many litres of water are needed for the task. (6 marks)

and

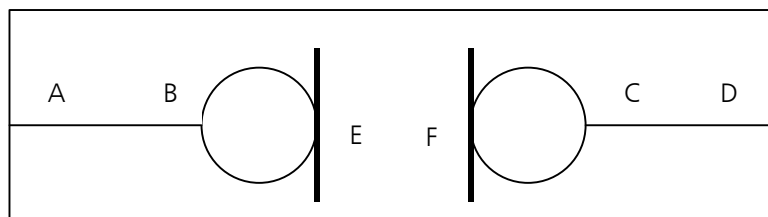
(b) The cost of hiring an 800 litres/min pump is £25 per hour or part of an hour. How much, in theory, will it cost to do the job? (5 marks)

and

(c) Unfortunately the 800 litres/min pump turns out to be only 85% efficient. How much will it now cost to do the job with this pump? (5 marks)

and

(d) This a plan view of the construction



Using all the above dimensions

if distance $AB = 7\text{m}$

and distance CD is the same (where points B and C are the nearest points on the circumference of the two cylinders to the ends of the pool),

calculate the distances:

- (i) BC ; and
- (ii) EF . (4 marks)

and

(e) The four inside walls are to be tiled completely (not the floor). The tiles measure 20 cm x 20 cm. How many will be needed (assuming no space is left between each tile)? (5 marks)

(All formulae and working out to be shown.)

Bibliography: Study Note 2401, Application of Number.

It was disappointing to note the number of candidates who failed to either read the question properly or were unable to use a calculator correctly.

Some of the most common faults were as follows:

- (a) the inclusion of the full capacity that both the solid cylinders would displace within the calculation even though it could be determined that only half of each was immersed.
- (b) & (c) the question clearly asked candidates to round up the cost for part of an hour - dividing the answer in (a) by 800 litres per minute does not give an answer in hours.
- (d) this part was generally well answered.
- (e) the candidates inability to calculate using the decimal point, giving answers ranging from 60 to 60,000; and a failure to recognise the difference between area and volume.

Despite the question clearly stating that *all formulae and working out should be shown*, this was sadly lacking in many scripts, which meant that available marks could not be awarded.

Finally, it concerned the examiners to note that many prospective Sub-Officers are clearly not aware that there are 1,000 litres of water within a cubic metre.

- 2 From the data shown overleaf, relating to an area's calls in 1998/99.
- (a) In what hour did the greatest number of incidents occur in:
- (i) 1998/99; and
- (ii) 1997/98? (2 marks)
- and
- (b) What is the average number of special service calls occurring per hour? (to the nearest whole number) (3 marks)
- and
- (c) Draw a frequency chart and from that state what is the mode for the number of over border calls occurring per hour. (5 marks)
- and
- (d) By what percentage have total calls fallen from 1997/98 to 1998/99? (5 marks)
- and
- (e) Draw a bar chart to show the 1998/99 hourly distribution of chimney fires. (10 marks)

(All formulae and working out to be shown.)

Bibliography: Study Note 2401, Application of Number.

This question was generally well answered by candidates with a few achieving maximum marks. This number would have been even greater if many candidates had taken a little more care to read and understand that part (c) required a frequency chart, not a graph. However, it was evident yet again that some were failing to use common sense when checking answers. It is difficult to believe that there really are candidates who think that there are 25 hours in a day!

There were also a number who attempted to answer all 5 parts of the question using only one side of a page, thereby making it extremely difficult for the examiners to discover areas in which to award marks that blur of figures produced.

QUESTION 2 DATA

INCIDENTS BY TIME OF CALL 1998/99										
Time	Fires	Misc Fires	Chimney Fires	False Alarms			Special Service	Over Border	Total 1998/99	Total 1997/98
				Malicious	Good Intent	Apparatus				
0001 - 0100	77	29	4	27	16	58	39	0	250	246
0101 - 0200	56	13	2	13	6	47	21	1	159	205
0201 - 0300	54	16	2	12	2	49	17	1	153	157
0301 - 0400	47	17	0	7	8	53	22	0	154	115
0401 - 0500	44	13	0	4	5	46	18	1	131	113
0501 - 0600	26	6	0	1	4	45	11	1	94	125
0601 - 0700	23	4	0	0	8	56	14	0	105	117
0701 - 0800	37	4	2	2	11	73	29	1	159	207
0801 - 0900	38	3	3	5	10	117	39	2	217	225
0901 - 1000	48	12	4	13	22	155	43	1	298	307
1001 - 1100	65	7	3	19	16	172	62	1	345	339
1101 - 1200	58	18	9	22	13	153	70	2	345	368
1201 - 1300	84	23	14	27	20	121	51	0	340	379
1301 - 1400	78	47	13	29	20	144	65	0	396	403
1401 - 1500	70	46	8	30	26	142	65	1	388	399
1501 - 1600	79	57	13	42	28	144	56	1	420	450
1601 - 1700	92	62	12	55	31	127	57	4	440	455
1701 - 1800	106	89	21	56	31	127	72	1	503	552
1801 - 1900	125	126	27	68	23	123	67	4	563	567
1901 - 2000	106	153	34	53	33	101	56	3	539	553
2001 - 2100	105	138	32	49	34	77	45	0	480	535
2101 - 2200	107	97	21	37	25	88	37	2	414	475
2201 - 2300	114	62	22	23	20	80	31	1	353	329
2301 - 2400	97	42	6	24	8	78	25	3	283	290

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